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# Barcode Studio

## Barcode Designer

Version 15.2

# User Manual

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TEC-IT Datenverarbeitung GmbH
Hans-Wagner-Strasse 6
A-4400 Steyr, Austria

t ++43 (0)7252 72720
f ++43 (0)7252 72720 77
office@tec-it.com
www.tec-it.com

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© 1998-2014
TEC-IT Datenverarbeitung GmbH
Hans-Wagner-Str. 6

A-4400 Austria
t.: +43 (0)7252 72720
f.: +43 (0)7252 72720 77
http://www.tec-it.com

# 3 Introduction

## 3.1 About

TEC-IT **Barcode Studio** is a tool for generating and printing barcodes.

**Barcode Studio** creates more than 100 different barcode symbologies: linear, 2D, postal and GS1 composite barcodes are supported. All barcode parameters are adjustable. The barcodes are created as image files (e.g. for using it in your artwork), as high quality vector images (for graphics design or pre-press applications), copied to the clipboard or printed directly with any printer. Batch barcode generation with external or manual entered data is also supported.

If you have any questions, please contact us.


| | |
|---|---|
| Address: | Hans-Wagner-Str. 6<br>AT-4400 Steyr<br>Austria/Europe |
| Phone: | +43 / (0)7252 / 72 72 0 |
| Fax: | +43 / (0)7252 / 72 72 0 – 77 |
| Email: | office@tec-it.com |
| Web: | http://www.tec-it.com |


## 3.2 Supported Operating Systems

- Mac OS (10.6 or higher) for Intel
- Windows 8
- Windows 7
- Windows Vista
- Windows XP
- Windows Server 2012 and 2012 R2
- Windows Server 2008 and 2008 R2
- Windows Server 2003
- Linux/UNIX (please refer to www.tec-it.com or request a build)

## 3.3 Restrictions of the Demo Version

- A demo marker across the barcode indicates that the demo version is active. The correctness of the barcode is not affected.
- To obtain a license key for the full version (without the demo marker) please order **Barcode Studio** online at http://www.tec-it.com/order/default.aspx.

# 4 Installation

## 4.1 Install Barcode Studio on Microsoft® Windows

On Microsoft® Windows operating systems (Windows8, Windos7, Vista, etc.), **Barcode Studio** is installed with the Windows Installer. If the Windows Installer is not available on the system, please download it from the following link:

http://www.microsoft.com/downloads/details.aspx?FamilyID=889482fc-5f56-4a38-b838-de776fd4138c&displaylang=en

Please follow the steps as outlined below (administrator privileges are required).

1. Open the installer by double-clicking it.
2. Follow the instructions in the installation wizard.

By default, **Barcode Studio** is installed in the following directories:

```
C:\Program Files\TEC-IT\BCStudio15  (binary files + documentation)
C:\ProgramData\TEC-IT\BCStudio\15.2 (templates, option file, etc.)
```

## 4.2 Install Barcode Studio on Mac OS X® (10.6 or higher)

For Mac operating systems (Mac OS X 10.6 or higher), **Barcode Studio** is provided as a zipped pkg-file.

Please follow the steps as outlined below.

1. Open the zip-file by double-clicking it.
2. Open the contained pkg-file also by double-clicking it.
3. Follow the instructions of the setup wizard.

# 5 Quick-Start

## 5.1 Introduction

This chapter will guide you through the most important functions of **Barcode Studio** by showing you how to create an EAN13 barcode. For more detailed explanation of the user interface and the available functions and settings, please refer to the chapters 6 to 10.

> ► Starting with **Barcode Studio** version 11 pre-defined barcode templates are available. The creation of standardized barcodes is simplified dramatically (see section 5.3).

## 5.2 How to Create an EAN13 Barcode

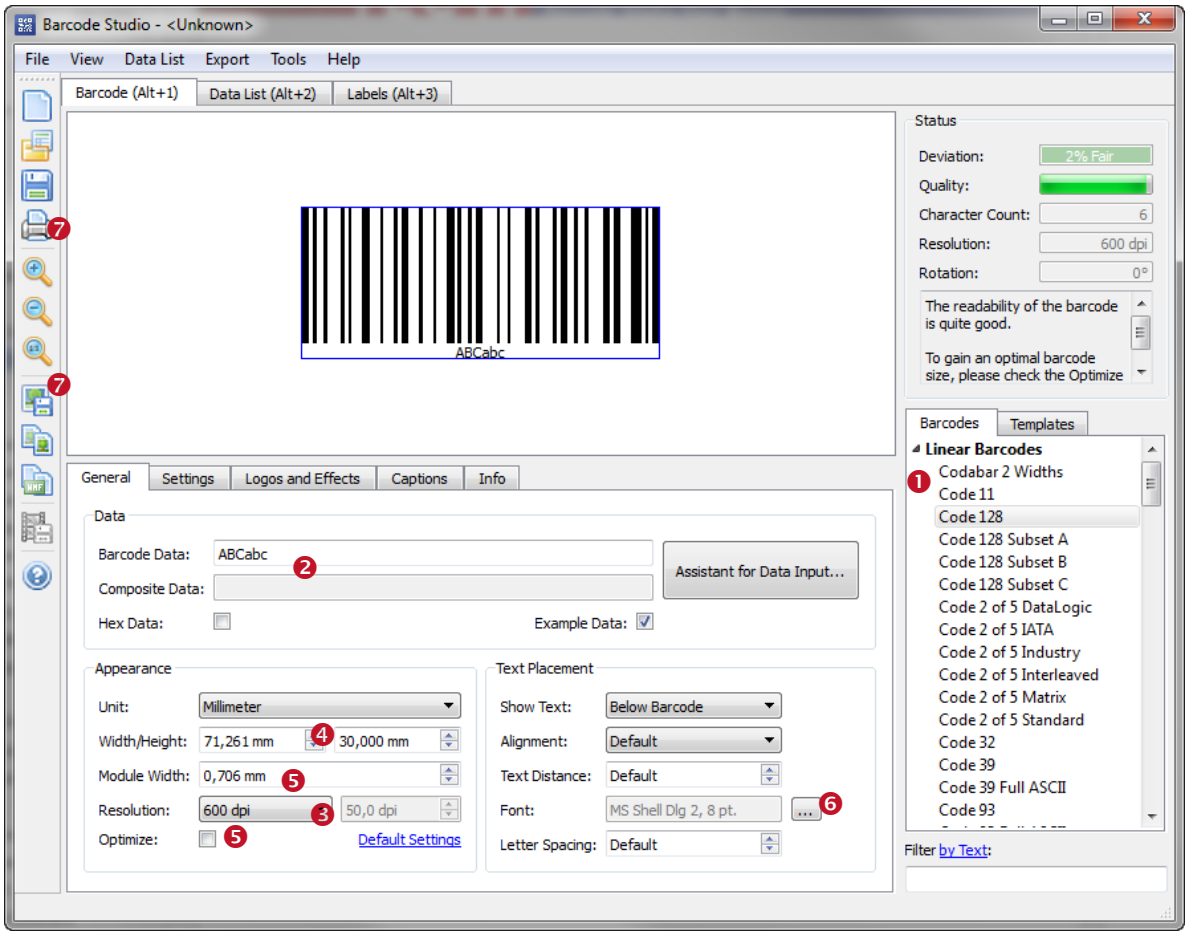
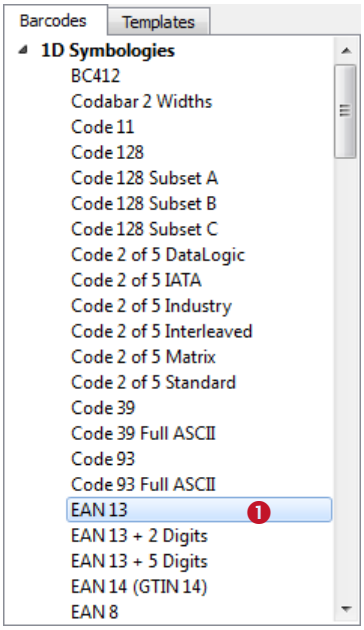



*Figure 1: Quick-Start – Barcode Studio Main Window*

In order to create an EAN13 barcode, please follow these steps:

1. Select the barcode type (symbology) – see section 5.2.1.
2. Enter the barcode data – see section 5.2.2.
3. Select the output resolution – see section 5.2.3.
4. Specify the barcode dimensions – see section 5.2.4.
5. Fine-tune the module width – see section 5.2.5.
6. Set font style and size – see section 5.2.6.
7. Export or print the barcode – see section.5.4.

### 5.2.1 Select Barcode Type (Symbology)




Select the required barcode type (symbology) in ❶. Choose “EAN 13”.

Hint: If you press the *E* key, the first entry starting with an “E” will be selected.

### 5.2.2 Enter Barcode Data

The EAN13 barcode needs exactly 12 digits (or 13 digits including the check digit). By default you will see the sample data “123456789012” if the checkbox “*Example Data*” is checked.

Enter the data to be encoded in ❷. Alternatively you can also use the *Data Input Assistant* (see 7.7.1.1).

The barcode view is updated after every change. The barcode cannot be drawn before you have entered the required twelve (or thirteen) digits.

If “*Example Data*” is not checked, the current input data may be invalid for the selected barcode (e.g. wrong characters or a wrong number of characters). In this case you will see an error message like the following:

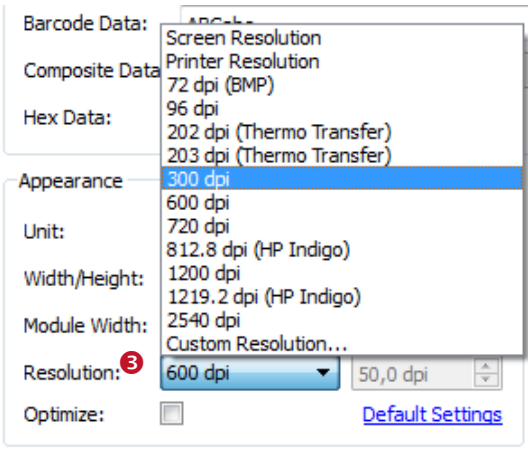
**Error: Wrong number of input characters (12 chars needed)!**

For a list of the most common error messages, please refer to Appendix B.

- The 13th digit in the resulting EAN13 barcode (in this case the digit “3”) is the check digit. It will be calculated automatically.
- If you enter 13 instead of 12 characters you need to provide the correct check digit yourself. This is not recommended. A wrong check digit may make the barcode unreadable!

### 5.2.3 Select Output Resolution

- **Barcode Studio** uses the selected resolution for computing the barcode images. Thus it is essential to adjust a resolution which leads to readable barcodes (see also section 5.2.5).
- Usually higher resolutions lead to a better barcode quality. However, at the same time it is important that the selected resolution accords to the resolution of the output device (or of the image processing software).




The output resolution can be adjusted in ❸.

In this example the output resolution is changed to “300 dpi”. If you are planning to print the barcode on a laser printer you would most probably select a higher resolution (600 or 1200 dpi).

If you want to ***export*** the barcode ***as image*** for your web page you could also choose “Screen Resolution” or “72 dpi (BMP)”.

- If you use barcode images in pre-press applications, please take care to avoid any scaling or resizing of the generated barcode image. This may lead to inaccuracies and distortions rendering the barcode unusable. Generate the barcode image in exactly the resolution and size as required!

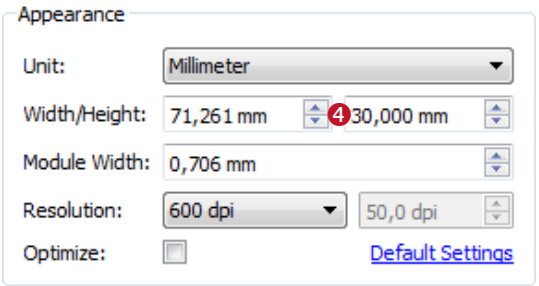
### 5.2.4 Specify Barcode Dimensions

The barcode dimensions can be modified by changing **width**, **height**, and **module width**.

Most label or barcode specifications require specific barcode dimensions. The following values are commonly used for EAN13:

| Magnification factor | Module width [mm] | Width [mm] | Height [mm] |
|---|---|---|---|
| 0.80 | 0.264 (SC0) | 29.83 | 20.73 |
| **1.00** | **0.330 (SC2)** | **37.29** | **25.91** |
| 1.50 | 0.495 (SC6) | 55.94 | 38.87 |
| 2.00 | 0.660 (SC9) | 74.58 | 51.82 |

*Table 1: EAN13 Dimensions (not complete)*



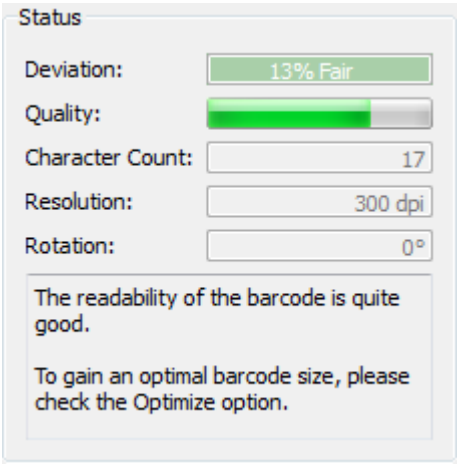

In this example we use the magnification factor 1.00.

Enter the width and the height in ❹. The appropriate module width will be calculated automatically.

The barcode now looks like this:

### 5.2.5 Fine-tune the Module Width

Yet the quality of the barcode is not perfect yet (see the Quality Watch at the top right corner of the **Barcode Studio** application window):




To optimize the barcode quality we recommend fine-tuning the module width. You have the following possibilities to do so:

- Select the option “Optimize” (see Figure 1, ❺).
- Choose the unit “Pixel” and enter a whole-numbered value in the field “Module Width”.
- Increase the output resolution.

The first two options both lead to a perfect barcode quality.

### 5.2.6 Set Font Style and Size

The font properties are set via the “Select Font” dialog. You can open this dialog by clicking the … button in the “Text Placement” section (see Figure 1 ❻).

This example uses a 10 pt. Courier New font:

## 5.3 Barcode Templates

The list of barcode templates contains a selection of frequently used barcode types including their default settings.

> ► The templates which are part of the **Barcode Studio** installation comply with various bar coding standards. By using these templates you create optimal barcodes and you save time for an optional certification of the barcode.

In order to create an EAN 13 barcode with default settings please perform following steps:

1. Go to the templates list.
2. Select the entry “EAN 13 / SC2 (100%)…”
3. Enter the barcode data – see section 5.2.2.
4. Adjust any other settings if needed.
5. Export or print the barcode – see section.5.4.

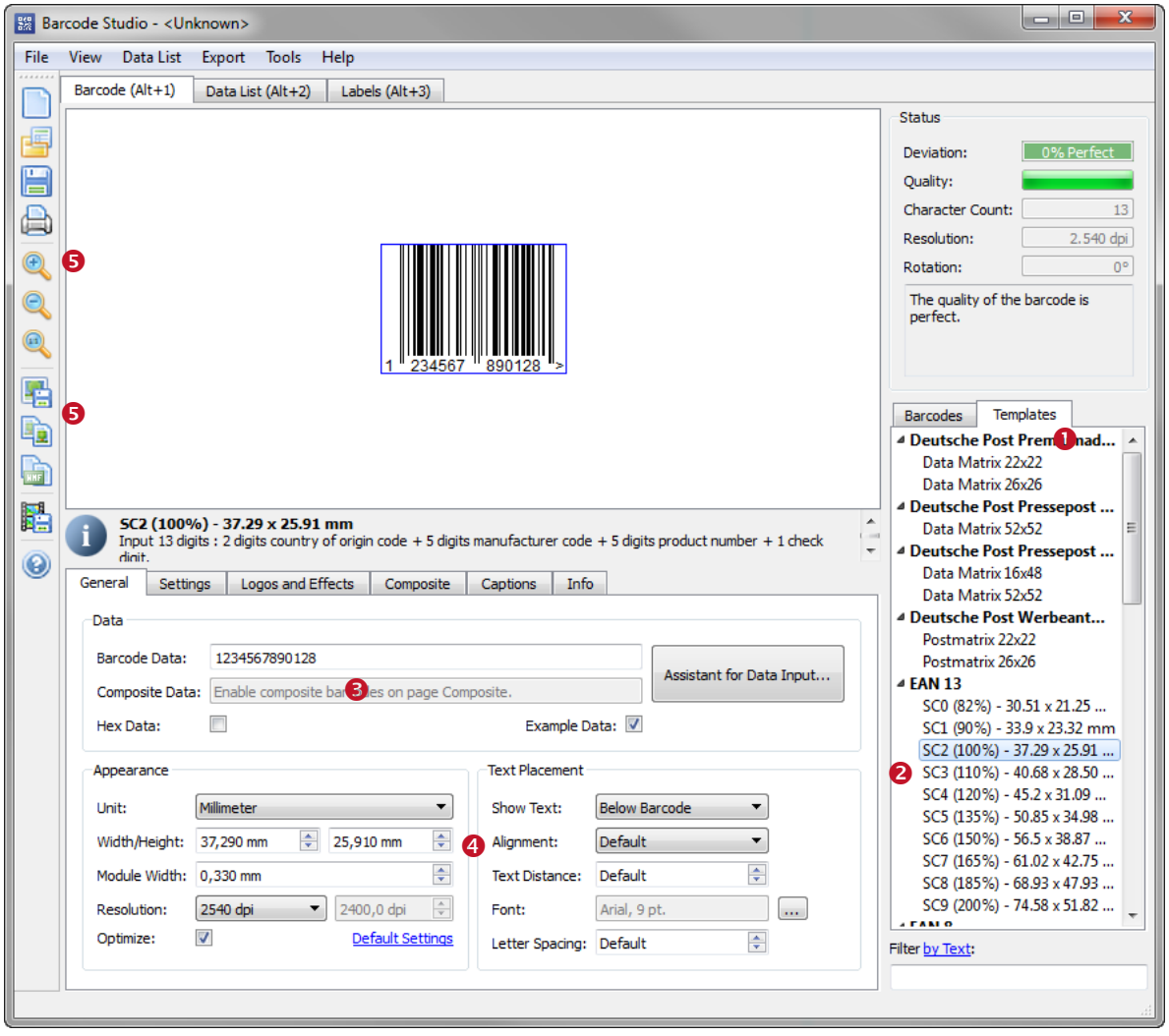

Barcode Studio - <Unknown>
File View Data List Export Tools Help
Barcode (Alt+1) Data List (Alt+2) Labels (Alt+3)
Status
Deviation: 0% Perfect
Quality:
Character Count: 13
Resolution: 2.540 dpi
Rotation: 0°
The quality of the barcode is perfect.
1 234567 890128
SC2 (100%) - 37.29 x 25.91 mm
Input 13 digits : 2 digits country of origin code + 5 digits manufacturer code + 5 digits product number + 1 check digit.
Barcodes Templates
Deutsche Post Pres...
Data Matrix 22x22
Data Matrix 26x26
Deutsche Post Pressepost ...
Data Matrix 52x52
Deutsche Post Pressepost ...
Data Matrix 16x48
Data Matrix 52x52
Deutsche Post Werbeant...
Postmatrix 22x22
Postmatrix 26x26
EAN 13
SC0 (82%) - 30.51 x 21.25 ...
SC1 (90%) - 33.9 x 23.32 mm
SC2 (100%) - 37.29 x 25.91 ...
SC3 (110%) - 40.68 x 28.50 ...
SC4 (120%) - 45.2 x 31.09 ...
SC5 (135%) - 50.85 x 34.98 ...
SC6 (150%) - 56.5 x 38.87 ...
SC7 (165%) - 61.02 x 42.75 ...
SC8 (185%) - 68.93 x 47.93 ...
SC9 (200%) - 74.58 x 51.82 ...
Filter by Text:
General Settings Logos and Effects Composite Captions Info
Data
Barcode Data: 1234567890128
Composite Data: Enable composite barcodes on page Composite.
Assistant for Data Input...
Hex Data:
Example Data:
Appearance
Unit: Millimeter
Width/Height: 37,290 mm 25,910 mm
Module Width: 0,330 mm
Resolution: 2540 dpi 2400,0 dpi
Optimize:
Default Settings
Text Placement
Show Text: Below Barcode
Alignment: Default
Text Distance: Default
Font: Arial, 9 pt.
Letter Spacing: Default

*Figure 2: Quick-Start with Templates – Barcode Studio Main Window*

## 5.4 Export or Print the Barcode

The barcode can be used in the following ways:

- Export to clipboard:
  The clipboard allows you to quickly insert the barcode into any application like Microsoft Word or Microsoft Excel using the keyboard shortcut Ctrl+V.
- File export:
  The file export creates an image file. Different bitmap and vector formats are supported.
- List export:
  In order to export multiple barcodes at once use the data list (see chapter 8). You can either use the barcode data or a sequential number as file names.
- Print:
  With the print command you can print barcode labels (see chapter 9).

For further information on the barcode export, please refer to chapter 6. The data list and the label printing are explained in the chapters 8 and 9.

# 6 Using Barcodes in Applications (Exporting Barcodes)

This chapter provides general instructions for using the created barcodes in applications. An explanation of the user interface and of the available barcode settings can be found in the following chapters.

## 6.1 General

You can export the barcodes created in **Barcode Studio** in the following ways:

- Copy the barcode to the clipboard (as image) and paste it into your application.
- Copy the barcode to the clipboard (as metafile) and paste it into your application. (Available under Microsoft Windows only.)
- Export the barcode to an image file.
- Export a series of barcode images (batch job).

Before exporting a barcode you have to adjust the required barcode settings. The size of the resulting barcode image can be controlled by changing the dimensions (width, height, and module width) and the output resolution (DPI) – see also section 7.7.2 . These settings apply to all kinds of export operations.

## 6.2 Resolution and Readability

- ► Do not resize exported barcode images with image manipulation software (like Photoshop®)! The quality and the readability might suffer!
- ► Whenever possible, let **Barcode Studio** create the barcode in the required size and resolution to avoid resizing later on.

#### 6.2.1.1 Barcode Quality

When exporting the barcode to a bitmap image (BMP, GIF, JPG, PNG, TIF), it must be converted from its internal resolution (high) to a graphical pixel resolution (low). During this process (rasterizing) the module width can vary due to rounding errors.

When exporting a barcode to a vector based image format (EPS) or as metafile to the clipboard, the internal representation of the barcode symbol allows very high resolutions (which are independent of the adjusted dpi). Thus it is recommended to use vector based image formats (EPS) whenever possible. However, in the context of certain applications (e.g. web applications) it is inevitable to use bitmap images.

The readability of a barcode can be estimated by considering the quality watch (see section 7.1, ❺). The quality of a barcode depends on the selected output resolution, size and content. To ensure an optimal readability check the option “*Optimize*”.

#### 6.2.1.2 Module Width

Larger module widths usually lead to a better readability of a barcode. In practice, for most linear barcodes, the module width should **never be less than 0.19 mm**.

## 6.3 Export to File

If you want to export a barcode as an image file, select *Export* ► *Export Barcode…* from the menu or press the keyboard shortcut *Ctrl+E.* In the *Save Image File* dialog choose a file name and select the image file type (e.g. “Bitmap (*.bmp)”). Then confirm by pressing the *Save* button.

The saved image can now be imported in your target application. (Example: In Microsoft® Word you can insert the barcode image by selecting *Insert* ► *Image* ► *From File…* from the menu.)

- The exported barcode symbol will match the preview in **Barcode Studio** exactly.
- For a list of available image formats, please refer to Appendix C.
- If you export images with a bitmap based file format (see Appendix C), resizing of the imported image is not recommended!

## 6.4 Copy to Clipboard (As Image)

To copy the current barcode as an image to the clipboard, you have to select *Copy to Clipboard (As Image)* from the menu (located in the *Export* submenu) or from the toolbar. You can also press the keyboard shortcut *Ctrl+B.*

Then switch to your target application and paste the barcode (e.g. in Microsoft® Word) by pressing *Ctrl+V* (or by selecting *Edit* ► *Insert* from the menu).

- Resizing barcode images may result in a loss of quality, in the worst case in unreadable barcodes.

## 6.5 Copy to Clipboard (As Metafile)

To copy the current barcode as vector based metafile (EMF) to the clipboard select *Copy to Clipboard (As Metafile)* from the menu (located in the *Export* submenu) or from the toolbar. You can also press the keyboard shortcut *Ctrl+M.*

Then switch to your target application and paste the barcode (e.g. in Microsoft® Word) by pressing *Ctrl+V* (or by selecting *Edit* ► *Insert* from the menu).

- Metafiles can only be used under Microsoft® Windows.
- Due to the vector based format you may resize the imported image within your target application without heavy losses in readability.
- The resulting barcodes may differ in dependence of the selected resolution and target application from the preview in **Barcode Studio** in size.

## 6.6 Export Data List

Data lists are used for exporting a series of barcode images and/or for label printing. Such a data list can be imported, generated and edited. See also chapter *8 Data List* and *9 Label Printing*.

# 7 Barcode Studio User Interface

## 7.1 Main Window

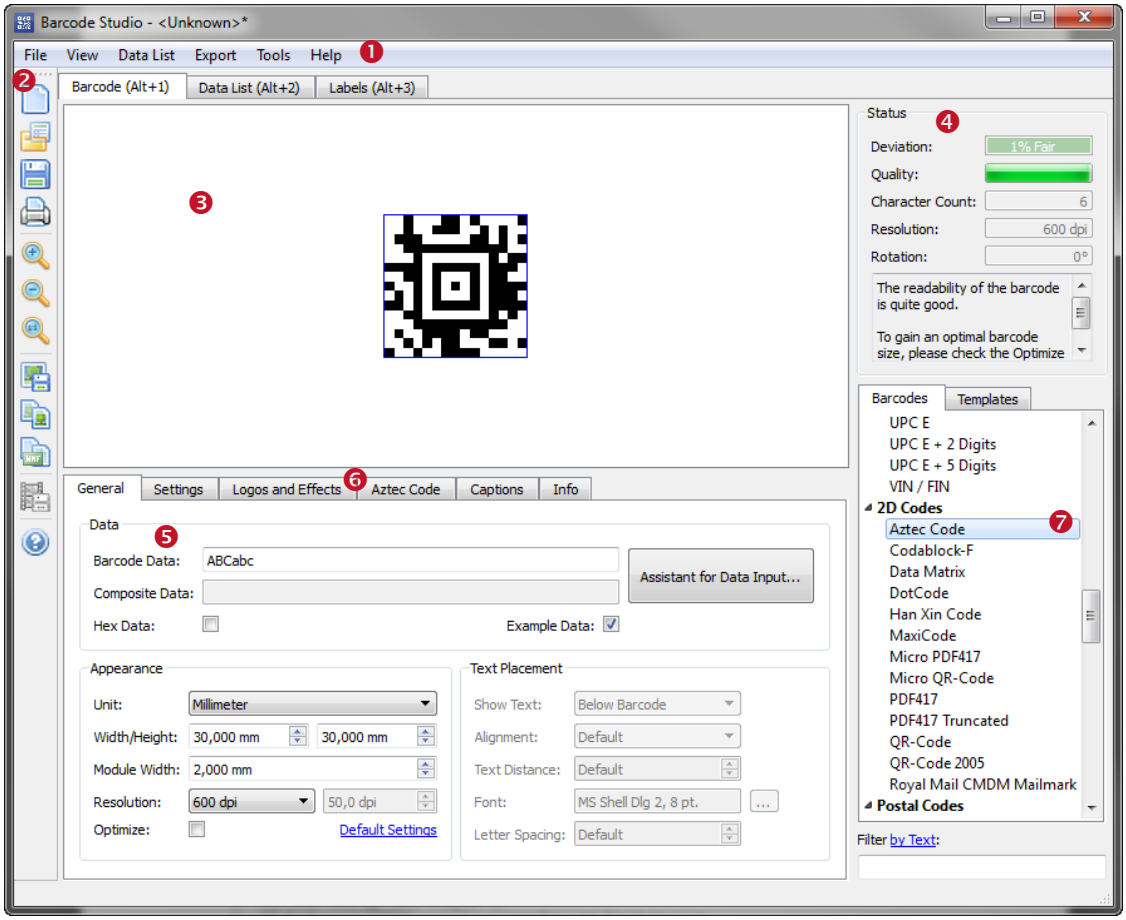



*Figure 3: User Interface*

The main window is split into the following areas:

1. Menu (see section 7.2)
2. Toolbar (see section 7.3)
3. Barcode View (see section 7.6)
4. Quality Watch (see section 7.4)
5. Barcode Settings (see chapter 7)
6. 2D Settings (available only for certain Barcode Symbologies)
7. Barcode Types and Templates (see section 7.5)

## 7.2 Menu

The menu gives you access to the following functions:

### 7.2.1 File

| | |
|---|---|
| New | Creates a new document (with initial barcode settings).<br>Shortcut: *Ctrl+N* |
| Open… | Opens an existing barcode settings file (*.bc). |

| | |
|---|---|
| | Shortcut: *Ctrl+O* |
| Save Settings<br>Save Settings As… | Saves the current barcode settings (symbology, dimensions, module width, etc.) into a file. Barcode settings files have the extension **.bc**.<br>Shortcut: *Ctrl+S (for Save)* |
| Export Barcode… | Exports the barcode to a picture file.<br>Shortcut: *Ctrl+E* |
| Save As Template… | Saves the current barcode settings as template file. |
| **Refresh Templates** | Refreshes the template list.<br>Shortcut: *Ctrl+R* |
| Print Barcode Info… | Prints the barcode and the most important settings (size, resolution, etc.). |
| **Print Labels…** | Prints the data list as labels (see also chapter 9).<br>Shortcut: *Ctrl+P* |
| | **Hints for Printing:**<br>▪ The output resolution, and therefore the values for quality and deviation, depends on the printer settings.<br>▪ Note: Inkjet printers sometimes produce better results if the bar width reduction is used (see also section 7.8.2.4). |
| Exit | Exits **Barcode Studio**.<br>Shortcut: *Ctrl+Q* |

### 7.2.2 View

| | |
|---|---|
| Zoom In | Increment the zoom in the barcode view.<br>Shortcut: *Ctrl++* |
| Zoom Out | Decrement the zoom in the barcode view.<br>Shortcut: *Ctrl+-* |
| Reset Zoom | Zoom is turned off. The barcode is shown in its original size. |
| Auto Zoom | Auto-Zoom mode is turned on or off. In Auto-Zoom mode the zoom factor is automatically adapted to the window size. |
| Zoom Dialog | Opens the zoom dialog. |
| | **Hint:**<br>▪ The zoom commands do not change the real size of the barcode, but only its view on the screen. |

### 7.2.3 Data List

| | |
|---|---|
| File Import… | Imports data from a text file and adds it to the data list.<br>Shortcut: *Ctrl+I* |
| Create Sequence… | Creates a data sequence and adds it to the data list. |
| Save as CSV File… | Export data list as *.csv file. |

### 7.2.4 Export

| | |
|---|---|
| Export Barcode… | Exports the barcode to a picture file.<br>Shortcut: *Ctrl+E* |
| Copy to Clipboard (As Image) | Copies the barcode as image to the clipboard.<br>Shortcut: *Ctrl+B* |
| Copy to Clipboard (As Metafile) | Copies the barcode as metafile to the clipboard (not available on Mac OS).<br>Shortcut: *Ctrl+M* |
| Export Data List… | Exports the data list as a series of barcode images.<br>Shortcut: *Ctrl+L* |

### 7.2.5 Tools

| | |
|---|---|
| Options… | Specifies the Application Options (see Chapter 10). |

### 7.2.6 Help

| | |
|---|---|
| Help | Opens the documentation.<br>Shortcut: *F1* |
| Barcode Reference | Opens the barcode reference document in the web browser. |
| TEC-IT Website | Opens the page www.tec-it.com in the web browser. |
| Advanced Label Printing | Opens a suggestion for advanced label printing software in the web browser. |
| YouTube | Opens a page with videos about Barcode Studio in the web browser. |
| Barcode Studio on Facebook | Opens the Barcode Studio web site on Facebook. |
| Twitter | Opens the Barcode Studio Twitter page. |
| Google+ | Opens the Barcode Studio Google+ page. |
| LinkedIn | Opens the Barcode Studio LinkedIn page. |
| Blog | Opens the TEC-IT Blog web site. |
| Buy Barcode Studio | Opens the TEC-IT order form in the web browser. |
| License... | Opens the dialog for entering your license data. |
| Check For Update… | Checks for updates of **Barcode Studio**. |
| About Barcode Studio | Displays information about the application, version number and copyright. |

## 7.3 Toolbar

*Figure 4: Toolbar*

The toolbars offer following functions:

| | | |
|---|---|---|
| | New | Creates a new barcode (with pre-defined settings). Shortcut: *Ctrl+N* |
| | Open | Opens an existing barcode settings file (*.bc). Shortcut: *Ctrl+O* |
| | Save | Saves the current barcode settings to your hard disk. Shortcut: *Ctrl+S* |
| | Print | Prints the data list as labels. Shortcut: *Ctrl+P* |
| | Zoom In | Increment the zoom in the barcode view. Shortcut: *Ctrl++* |
| | Zoom Out | Decrement the zoom in the barcode view. Shortcut: *Ctrl+-* |
| | Reset Zoom | Zoom is turned off. The barcode is shown in its original size. |
| | Export Barcode | Exports the barcode to a picture file. Shortcut: *Ctrl+E* |
| | Copy to Clipboard (As Image) | Copies the barcode as image to the clipboard. Shortcut: *Ctrl+B* |
| | Copy to Clipboard (As Metafile) | Copies the barcode as metafile to the clipboard. Shortcut: *Ctrl+M* |
| | Export Data List | Exports the data list as a series of barcode images. Shortcut: *Ctrl+L* |
| | Help | Opens the documentation. Shortcut: *F1* |

## 7.4 Quality Watch – Status Section

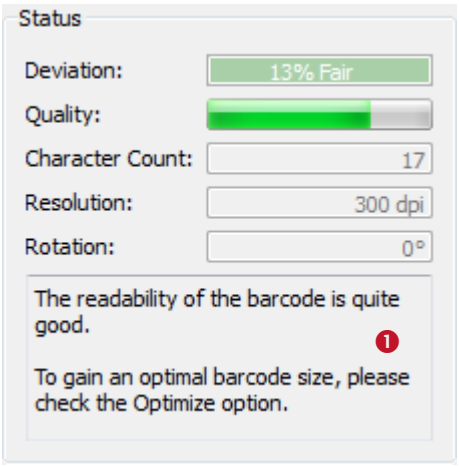



*Figure 5: Quality Watch*

### 7.4.1 Deviation

The less the deviation the better are quality and readability of the barcode. The deviation depends on the output resolution and the print ratio of the barcode. You can also improve the quality by changing the module width to an appropriate value. As measurement unit select “Pixel” and set the module width to an *integer value* (1, 2, 3, etc., 25, etc.).

The field “Deviation” will report one of the following values:

| Tolerance | Aberration | Description |
|---|---|---|
| Perfect | 0% | Optimal output quality. |
| Fair | 1-15% | Should be readable with most barcode scanners. |
| Poor | 16-25% | May be readable. |
| Bad! | 26-50% | Not readable in most cases. |
| Data Loss! | 51-100% | Total or partly loss of information. Unreadable barcode. |

*Table 2: Barcode Qualities*

### 7.4.2 Quality

The quality of the barcode – the higher the deviation, the lower is the quality.

### 7.4.3 Character Count

Displays the number of characters in the barcode data.

### 7.4.4 Resolution

The current output resolution in dpi (dots per inch).

### 7.4.5 Rotation

The rotation of the barcode in degrees.

### 7.4.6 Hint Box

The hint box ❶ displays information about the current barcode quality as well as recommended actions for improving the readability.

## 7.5 Barcode Types and Templates

### 7.5.1 Barcode Type

Select the required barcode type (= symbology) from the *Barcodes* list (see Figure 3, ❼). For a better overview the list is divided into 1D Symbologies, 2D Symbologies, Postal Codes, GS1 DataBar, HIBC Codes and SCANPAY Barcodes.

> ► For 2D codes like Aztec Code, Codablock-F, PDF417, MicroPDF, Micro QR-Code, MaxiCode, Data Matrix, QR-Code, GS1-DataBar Stacked and variants, as well as for all symbologies which are derived from these (HIBC, QR-Code 2005, etc.), and for all Composite Symbologies you need a 2D license. For the other symbologies a 1D license is sufficient.

If you want to learn more about the selected symbology, please examine the *Barcode Reference* from the Help menu.

If a filter is active the number of shown barcode types is displayed in the tab header.

### 7.5.2 Template

Select the required template from the *Templates* list. If you choose a template all previously adjusted settings are overwritten with the template settings.

You can add your current configuration to the templates by saving it with *Save As Template…* from the *File* menu. To refresh the template list choose the menu item *Refresh Templates*.

If a filter is active the number of shown templates is displayed in the tab header.

### 7.5.3 Filter

In order to find the desired barcode type or template more easily, the user can add a filter text in the field below the Barcodes / Templates list. Filters restrict the elements shown by the lists.

The user may switch between two filter options *by Text* or *by Encodable Data*, what can be done by clicking the link with the opposite text.

#### 7.5.3.1 Filter by Text

The affected lists only show those list entries that contain the filter text or are related to it. This option applies to both, *Barcodes* and *Templates* list.

#### 7.5.3.2 Filter by Encodable Data

The *Barcode* list is restricted to the barcode types that are able to encode the filter data.

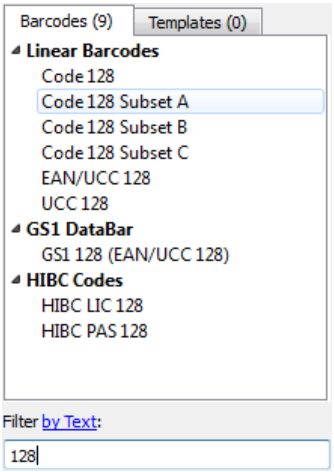
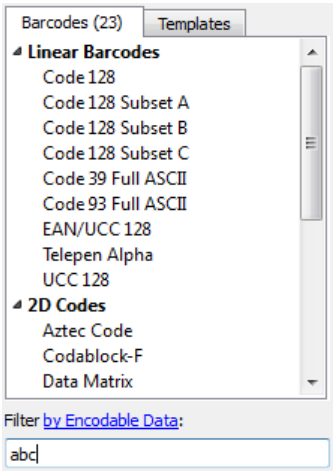



*Figure 6: Filter by Text*




*Filter by Encodable Data*

## 7.6 The Barcode View

*Figure 7: Barcode View*

The Barcode View shows the barcode in its actual appearance (as it will be printed).

To change the size of the barcode, enter the required dimensions in the “Appearance” section (see section 7.7.2). The quality of the barcode depends on the output resolution and on the module width. You will find a quality watch in the “Status” section (see section 7.4).

## 7.7 Page General

### 7.7.1 Data

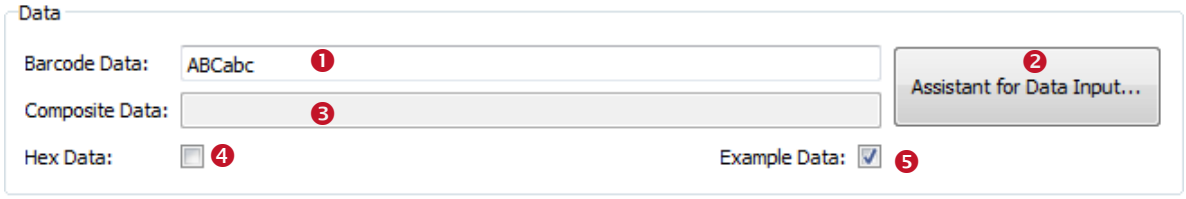



*Figure 8: Data Section*

#### 7.7.1.1 Barcode Data

The barcode content is entered in the field “Barcode Data” ❶ or by using the “Data Input Assistant” ❷. The assistant allows the input of unstructured raw data as well as the comfortable input of special data formats (e.g., the contact data for a business card). However such data formats are not supported by all barcode types. The assistant may also be used for importing barcode data from a text file.

Please note:

- Each barcode type is able to represent a specified set of data-characters. Some barcode symbologies can hold digits. Others may contain alphanumeric characters (digits + letters + punctuation characters). Again, others may use the full ASCII character set.

#### 7.7.1.2 Data Input Assistant

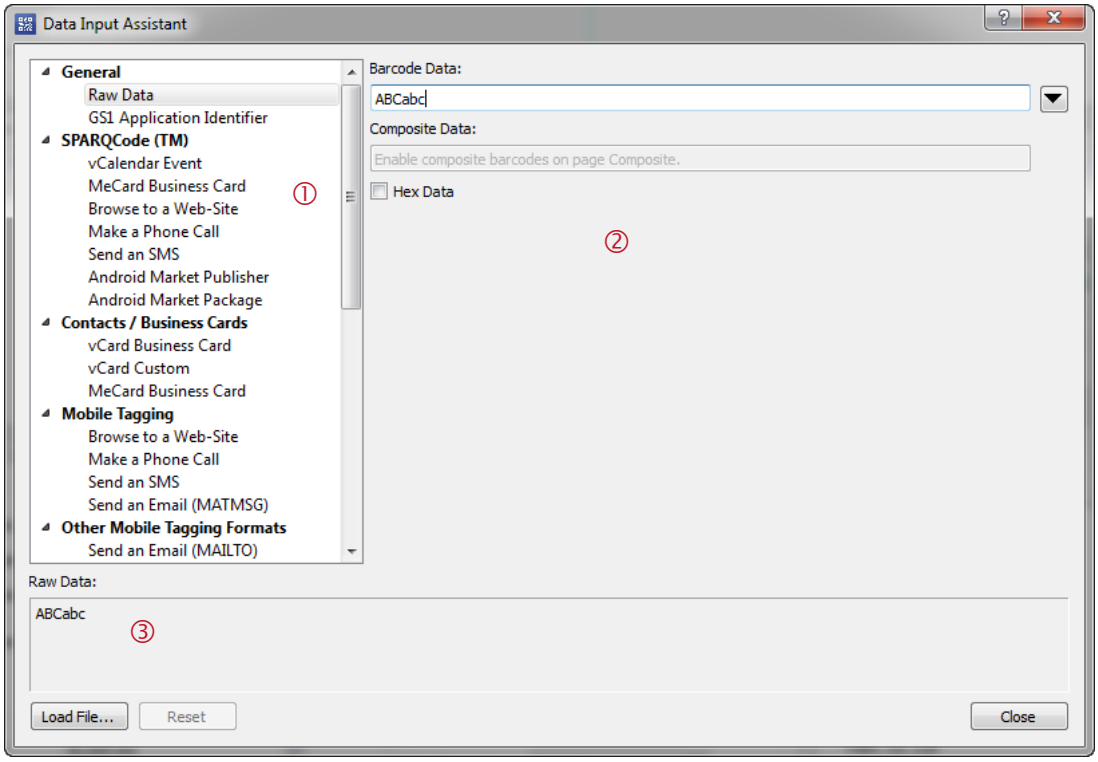



*Figure 9: Data Input Assistant*

The *Data Input Assistant* allows you to comfortably enter the barcode data in different formats. Depending on your selection in ① a different input mask will be show in ②. E.g., if you have selected a business card format in ①, then ② will show the corresponding input fields for first name, last name, company, etc. If you have selected the GS1 format then ② will show a table for editing the single AIs (Application Identifiers) in the barcode (see example below). **Barcode Studio** will do the correct formatting for the particular barcode data automatically. The formatted data can be inspected in ③.

- The number of available data formats in ① depends on your current barcode selection. For Code 128 the editing will be restricted to raw data. For other symbologies (like QR-Code) a variety of data formats is available.
- Besides that **Barcode Studio** offers the possibility to specify your own data formats. If required, please contact us!

Furthermore the assistant allows you to import barcode data from a text file (button *Load File…*). For clearing all data fields, please use the *Reset* button.

The data input for the *"Raw Data"* format (pre-selection) is quite similar to the input in the main window. However the assistant offers you the additional possibility to enter the data in a multi-line edit control (use the button ▼).

Below you will find examples for editing different data formats:

Example Calendar Entry:
(As symbology the QR-Code is used)

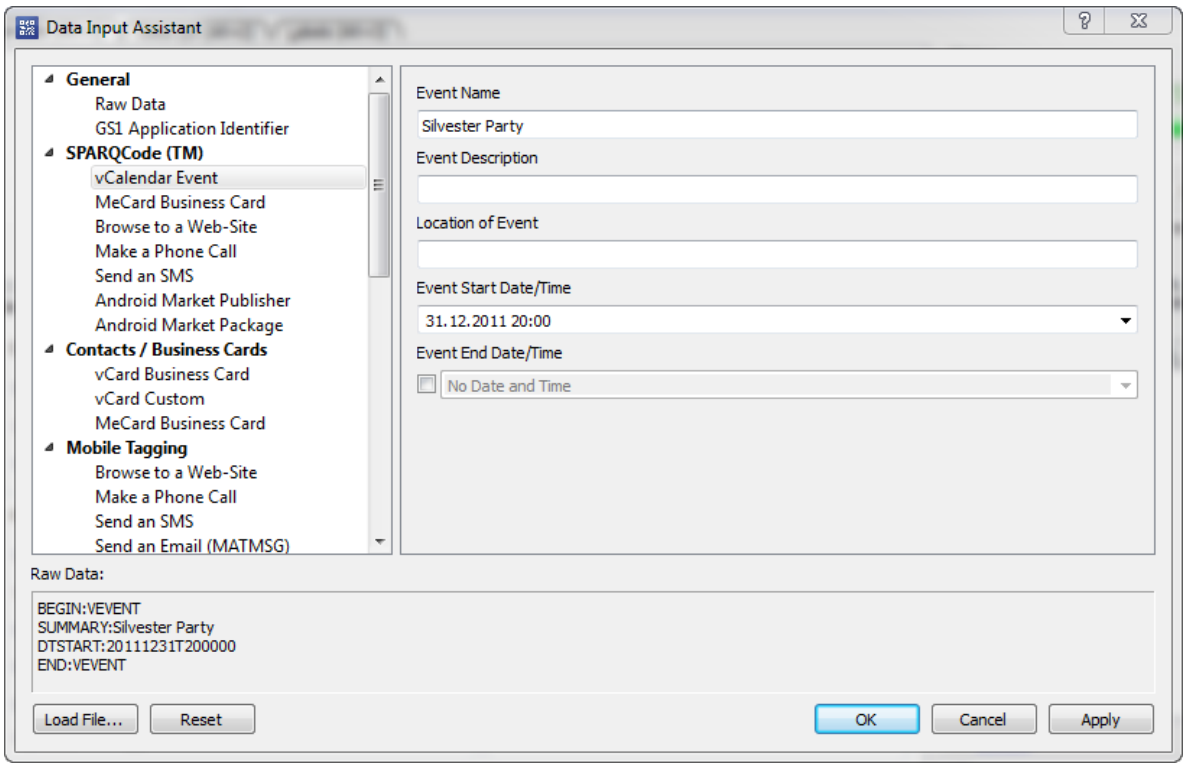



*Figure 10: Data Input Assistant – vCalender*

Example GS1 Application Identifier:
(As symbology GS1 128 is used)

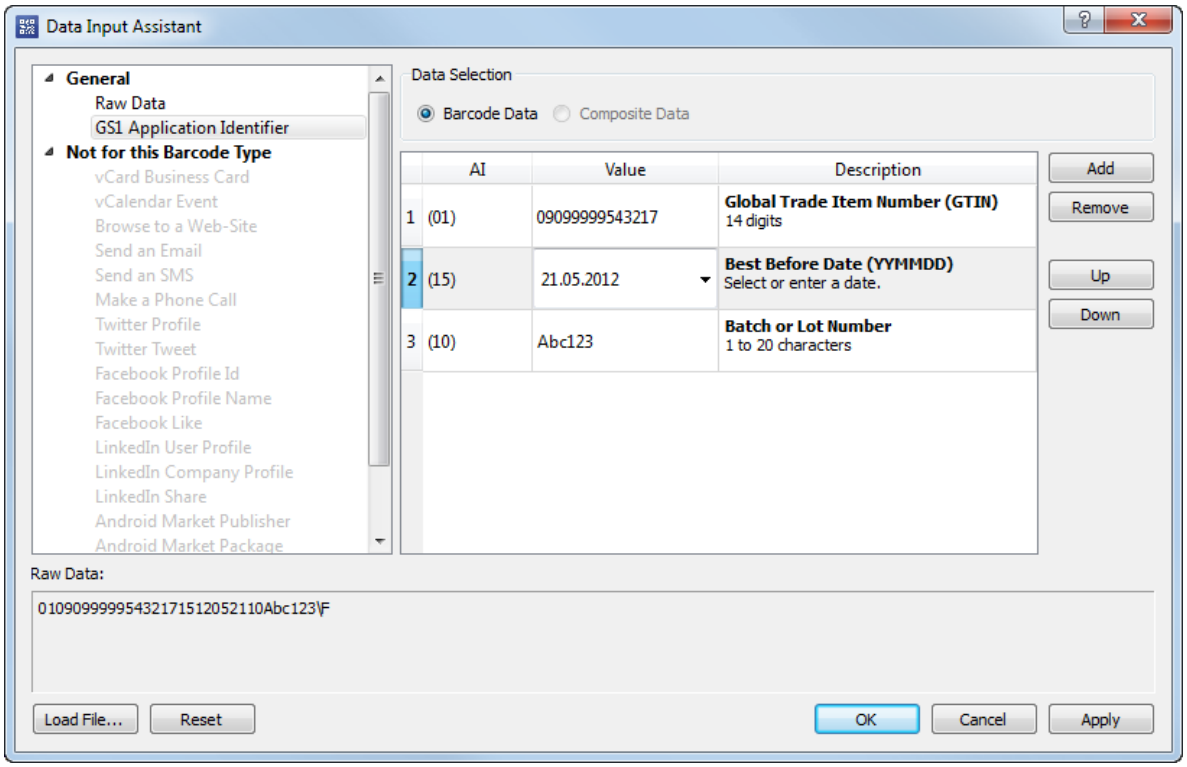



*Figure 11: Data Input Assistant – GS1 Application Identifier*

#### 7.7.1.3 Add Control Characters

You can enter control characters directly in the edit field or use the context menu. Open the context menu by right-clicking in the edit field and choose *Add Control Characters*. Then select the control character to insert from the submenu.

Because control characters are represented by special character combinations (like \F for FNC1), **Barcode Studio** activates escape sequences automatically (see section 7.8.1.2).

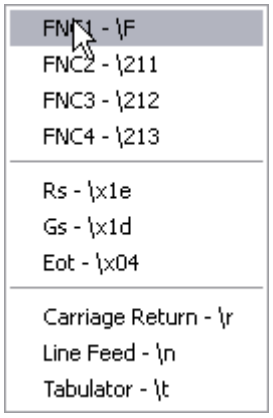



*Figure 12: Add Control Character*

For more information on all available control characters, please refer to the “Barcode Reference” available on www.tec-it.com or via the menu *Help* ► *Barcode Reference*.

#### 7.7.1.4 Check Digit Override

Some barcodes with a predefined number of utilizable data characters (like all EAN, UPC, Postnet and RSS-14 codes) contain a check digit on a fixed position in the barcode data.

Example:

The EAN13 code consists of 12 utilizable digits and 1 check digit on the last position (❻).

If you enter 12 digits as barcode data the check digit will be calculated and inserted automatically. However, you can also enter all 13 digits and override the calculated check digit.

- ► Note: If the barcode data already contains a check digit, the barcode is only valid if the check digit is equal to the automatically calculated check digit.
- ► Only if the check digit method is set to *None* (see section 7.8.1.1), the correctness of a check digit remains unchecked. Under normal circumstances you should not use this setting – we recommend relying on the automatic calculation of the check digit(s) by **Barcode Studio.**

#### 7.7.1.5 Composite Data

The Composite Data field (❸) is only enabled if the selected barcode type supports composite data (check if the ***Composite*** page is visible) and if a *2D Composite Component* has been selected (“Auto”, “CC-A”, “CC-B” or “CC-C”) on that page.

- ► You can also enter the composite data in the Barcode Data field by separating the composite data from the linear barcode data by the vertical bar character "|".

#### 7.7.1.6 Hex Data

If this option is selected (see Figure 8, ❹) the barcode data is treated as hexadecimal data. This property applies to the barcode data field and to the composite data.

Whenever *Hex Data* is enabled, **Barcode Studio** treats manually entered data as well as imported data as a hexadecimal character sequence. This sequence is internally converted to a normal character sequence before a barcode is generated.

#### 7.7.1.7 Example Data

If the option *"Example Data"* is selected (see Figure 8, ❺), **Barcode Studio** provides a valid example data string for the currently selected barcode type. The data is adapted automatically if you change the symbology.

### 7.7.2 Appearance

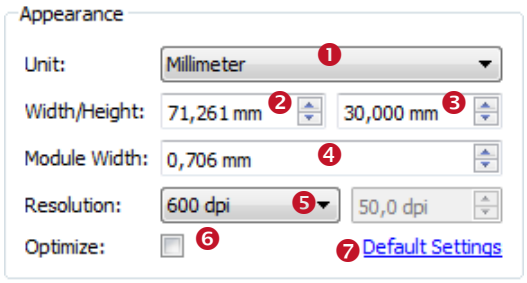



*Figure 13: Appearance Section*

#### 7.7.2.1 Unit

Field ❶ specifies the measurement unit for displaying and/or entering the dimensions of the barcode. Possible values are:

- Millimeter
- Inch
- Mils (=1/1000 inch)
- Pixel.

#### 7.7.2.2 Dimensions (Width, Height)

Use the settings ❷ and ❸ to change the width and the height of the barcode. The preview is updated immediately.

| Unit | Description |
|---|---|
| Millimeter | The width and the height of the barcode in millimeters.<br>The physical width (in pixels) can be calculated as follows:<br>width (pixels) = width (mm) / 25.4 * resolution (dpi) |
| Inch | The width and the height of the barcode in inches.<br>The physical width (in pixels) can be calculated as follows:<br>width (pixels) = width (inch) * resolution (dpi) |
| Mils | The width and the height of the barcode in mils.<br>The physical width (in pixels) can be calculated as follows:<br>width (pixels) = width (mils) / 1000 * resolution (dpi) |
| Pixel | The width and the height of the barcode in pixels.<br>The width and the height are specified in pixels. The resulting dimension on the screen depends on the adjusted resolution (dpi). |

*Table 3: Units*

#### 7.7.2.3 Module Width

The module width is entered in field ❹.

Every barcode is divided into several "modules". A module is the smallest bar (or space) segment. The module width is the fundamental measuring unit for barcodes. All bar and space widths base on this setting. A change of the module width causes a change of the barcode width and vice versa.

Exceeding the lower limit of the module width leads to unreadable barcodes (e.g., if the module width is smaller than 1 pixel). The minimum limit depends on the resolution of screen, printer, or image.

- The module width should be 0.19 mm or greater, otherwise barcode readers will have problems to scan the barcode.

#### 7.7.2.4 Resolution (DPI)

Enter the required resolution in ❺:

| Resolution (DPI) | Description |
|---|---|
| Screen Resolution | The image will be exported in exact the same size as displayed in **Barcode Studio**.<br>Depending on your operating system and on the display settings within the operating system this resolution may differ. Typical values are 72, 96 or 120 dpi. |
| Printer Resolution | Use the DPI setting of the currently selected printer. |
| 72 dpi (BMP) | Create the image with 72 dpi. |
| 96 dpi<br>:<br>2540 dpi | Create the image with the given dpi.<br>Higher dpi values result in larger (and more detailed) image files. |
| Custom Resolution… | Create the image with the custom resolution added in the field aside. |

*Table 4: Resolution Settings*

- To increase the accuracy of the barcode symbol you can increase its resolution.
- Consider that the resolution set in **Barcode Studio** must fit to the resolution of the printer or the target application.
- Image Export: Most applications show (and print) images (and therefore barcodes exported as image) in screen resolution. If the resolution of the barcode image is higher than the screen resolution, the output size will be displayed bigger than in **Barcode Studio**.
  Example: If your screen resolution is 96 dpi and the exported image has a resolution of 300 dpi it will be displayed about 3 times as large as in **Barcode Studio.**
- However, only **few** professional layout applications consider the resolution correctly.
- The dpi value can only be stored in certain image formats!
  E.g., when exporting an image as GIF file, the adjusted resolution (dpi) will not be stored. Only the formats BMP, JPG, PNG, and TIF are capable of storing the resolution.
  For detailed information, please refer to Appendix C.

#### 7.7.2.5 Optimize

If the *"Optimize"* option ❻ is checked, the module width of the barcode will be set to a whole-numbered pixel size (to the nearest lower value). Hereby the pixel deviation is reduced to a minimum or eliminated completely.
In other words: The barcode is printed using whole-numbered pixel sizes only. This avoids aliasing effects and guarantees an optimal scanning quality.

- If the "Optimize" option is checked, the module width will be adjusted for optimum output quality.

- This setting can be very helpful especially for lower resolutions.
- The barcode view shows the barcode symbol in optimal quality only, if the resolution was set to “Screen Resolution”. The preview is not detailed enough to display higher resolutions correctly. More detailed output can only be achieved on the according output devices (printer, image, etc.).

#### 7.7.2.6 Reset Button

Use the link “Default Settings” ❼ to reset the barcode to its initial size.

### 7.7.3 Text Placement

This section describes the settings regarding the human readable text.

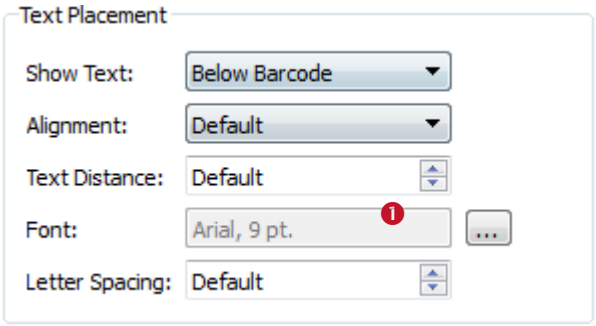



*Figure 14: Text Placement Section*

#### 7.7.3.1 Show Text

Choose whether and where the human readable text is shown. Allowed values are *No Text*, *Below Barcode* (default), and *Above Barcode*.

Many barcode types, as for instance the 2D symbologies, do not have a human readable text. For these types the option cannot be changed.

*Above Barcode* cannot be enabled in conjunction with barcode types like EAN 8, EAN 13, UPC A, or UPC E.

#### 7.7.3.2 Alignment

This property adjusts the alignment of the human readable text (Default, Left, Right, and Center).

#### 7.7.3.3 Text Distance

This property adjusts the distance between the “human readable text” and the barcode (in mm).

#### 7.7.3.4 Font

Click the ... button to select the font for the human readable text. The selected font is displayed in text box ❶.

#### 7.7.3.5 Letter Spacing

This property adjusts the spacing between the letters of the human readable text (in pt.).

## 7.8 Page Settings

### 7.8.1 Advanced Barcode Settings

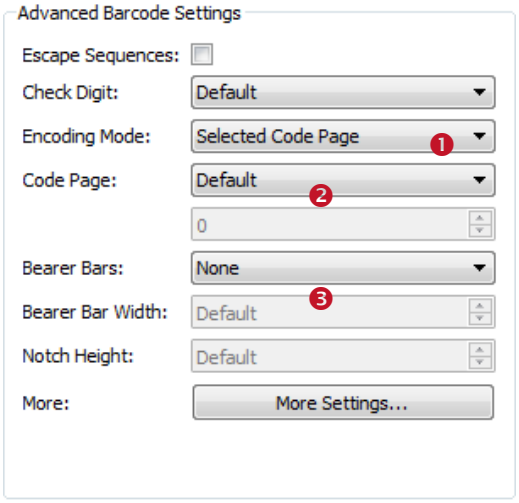



*Figure 15: Advanced Barcode Settings Section*

#### 7.8.1.1 Check Digit

This property specifies the check digit calculation method. In order to guarantee that the barcode data is going to be read properly a check digit can be added at the end of the utilizable data. A comparison of the barcode content with the check digit informs the scanning device (scanner) about incorrect scans and forces the device to repeat or reject the scan. The check digit calculation method is standardized for certain common barcodes types. Using check digits is mostly optional – but often recommended for particular symbologies and standards.

When set to **default** the check digit is calculated according to the specification of the selected barcode. Modifications are admissible for barcodes with selectable check digit methods or for special applications only.

For additional information on check digit calculation, please refer to the “Barcode Reference” available from www.tec-it.com or via the menu *Help* ► *Barcode Reference*.

#### 7.8.1.2 Encoding / Code Pages

With the fields *Encoding Mode* (❶) and *Code Page* (❷) the user can affect the interpretation of the input data.

For a general overview about encoding and code pages, please refer to the “Barcode Reference” available from www.tec-it.com or via the menu *Help* ► *Barcode Reference*.

- Data is always passed as UNICODE stream to **Barcode Studio**. Since UNICODE characters always consist of more than one byte and most of the barcode types are only able to encode one byte per character, it is not always clear how the input data should be interpreted. So we give you the possibility to decide yourself.
- Per default the input data is converted to the selected *Code Page* (see below). If other kinds of interpretations are needed, you have to change this property.

You have following possibilities:

| Value | Description |
|---|---|
| Selected Code Page | Converts the input data to the code page, which is selected in the property *Code Page.* (default) |
| Lo-Bytes only | Considers only the lower bytes of the input characters, the higher bytes are ignored. |
| Lo- before Hi-Byte | The data is passed as it is. No conversion is done. All bytes are considered. A lower byte is passed before the higher byte. |
| Hi- before Lo-Byte | Consider both bytes but change the order of lower and higher byte. That means a higher byte is encoded before the lower byte. |

*Table 5: Compression*

The *code page* is related to the property *Encoding Mode*. It is only considered if the encoding mode is set to *Selected Code Page*. You can choose between several pre-defined code pages (e.g. ANSI, ISO 8559-1 Latin I, UTF-8, Shift-JIS…) or add the ID of a custom code page by selecting *Custom Encoding…* and by entering the ID in the edit field aside.

#### 7.8.1.3 Escape Sequences

The use of escape sequences is appropriate if you need to encode control characters like carriage return or FNC1 into the barcode.

This option specifies, whether escape sequences (like "\n") shall be translated or not (default: no). Each escape sequence starts with a backslash ("\") and is followed by one or more characters. For a list of recognized escape sequences, please refer to the additional document "Barcode Reference" available via the menu *Help ► Barcode Reference* or from www.tec-it.com.

► If escape sequences are activated, the backslash character can't be used directly in the barcode data. It must be replaced by a double back-slash "\\" in order to be encoded correctly.

#### 7.8.1.4 Bearer Bars

Select the kind of bearer bars you want to use. Bearer bars help a decoder to detect the full width of a barcode and reduce the possibility of partial scans (decoding only a part of the symbol). You can change the width of the Bearer Bars in ❸.

#### 7.8.1.5 Notch Height

This property adjusts the height at which the synchronization bars (e.g. the double lines in EAN on the left, center and on the right side) extend the regular barcode height.

### 7.8.2 Drawing

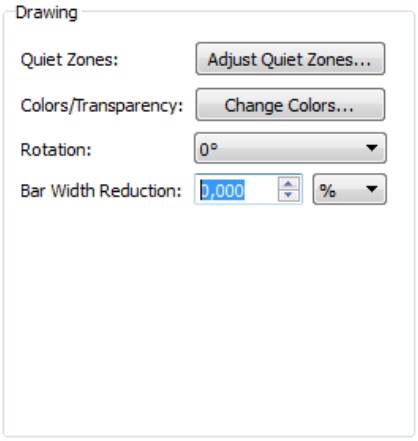



*Figure 16: Drawing Section*

#### 7.8.2.1 Quiet Zone

Click the *Adjust Quiet Zones…* button to open the *Quiet Zones* dialog.

This property adjusts the sizes of the quiet zones around the barcode. The sizes can be given in several units like *number of modules*, *Millimeters*, *Inches*, *Mils*, and *Pixels*.

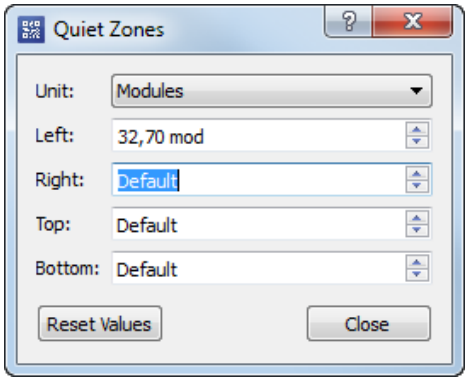



*Figure 17: Quiet Zones*

You can configure the quiet zone for all four sides of the barcode independently from each other. By clicking *Reset Values* all values are reset to zero.

#### 7.8.2.2 Colors / Transparency

Click the *Change Colors…* button to open the Colors/Transparency dialog.

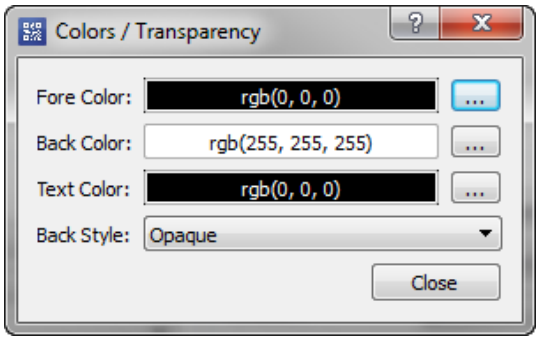



*Figure 18: Colors Dialog*

Click the ... button beside the color that you want to change. Then select the desired color in the appearing dialog.

| | |
|---|---|
| **Fore Color** | The foreground color of the barcode (color of the bars). |
| **Back Color** | The background color of the barcode (color of the spaces). |
| **Text Color** | The color of the “human readable text”. |
| **Back Style** | Mode for drawing the background of the barcode. The background can be set either to transparent (background shines through) or opaque (= default; background is overwritten with the background color). This setting is also relevant if you use copy and paste (clipboard). |

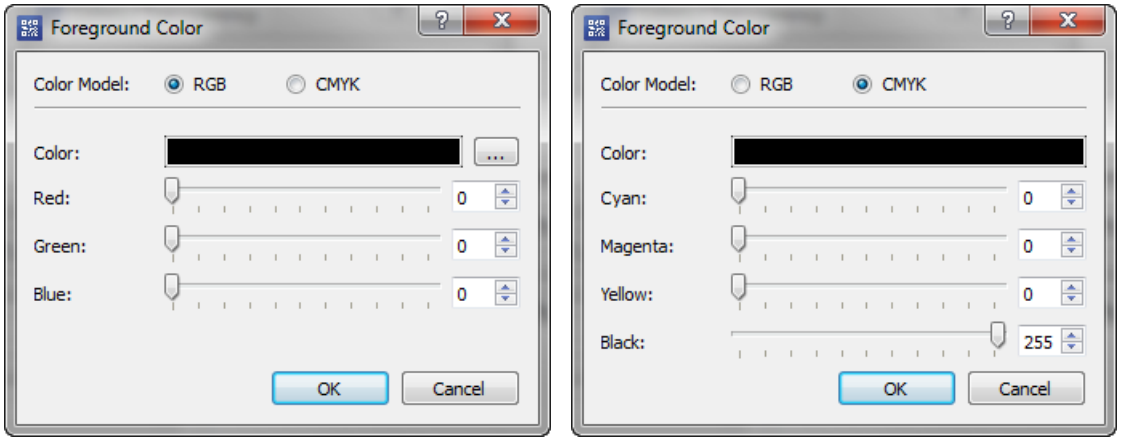



*Figure 19: Color Selection Dialog for Microsoft Windows*

Because Microsoft Windows does not offer to select colors from the CMYK model by default, Barcode Studio offers a dialog where the user may choose between the color models RGB or CMYK. Change the color by selecting the color shades directly or click the button to open the system color dialog.

#### 7.8.2.3 Rotation

This property defines the barcode rotation. Possible values are 0°, 90°, 180°, and 270°.

#### 7.8.2.4 Bar Width Reduction

When printing on inkjet printers, the ink that is absorbed by the paper tends to diffuse. Setting the bar width reduction allows you to work against this spreading of ink. This property is also useful for laser printers with high toner saturation.

The bar width reduction can be specified in several measure units like *percent of the module width*, *mm*, *Inch*, and *Mils*. For instance, if the unit is set to percent and the value is set to 20 all bars will be narrowed by 20 percent of the module width.

► Be careful: When using this feature we recommend you to do several test scans to make sure that the barcode can be scanned correctly. A common value to start with is 15%. Setting the bar width reduction to more than 50 percent might leave the barcode unreadable!

### 7.8.3 More Settings

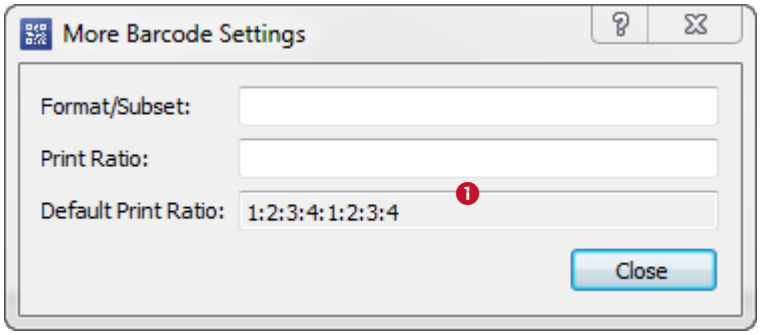



*Figure 20: Dialog More Settings*

#### 7.8.3.1 Format/Subset

The format string is used for formatting the utilizable data of the barcode according to defined rules. It operates with substitute symbols to indicate how the data shall be structured.
With the format string it is possible to insert constant characters to the barcode data. Control characters make it possible to change the Subsets for Code 128, EAN 128 and UCC 128 or to define the desired start/stop character of CODABAR.

For more information on format strings, please refer to the “Barcode Reference” available from www.tec-it.com or via the menu *Help ► Barcode Reference*.

#### 7.8.3.2 Print Ratio

The print ratio describes the relationship between the different bar- and space-widths of a barcode (do not mix this up with the width/height ratio of a symbol!). It is specified by a list of colon-separated-values. The list starts with **n** bar widths, followed by **m** space widths. The numbers **n** and **m** depend on the barcode type.

The single values specify a multiple of the module width:

- 1 → “Equal to the module width”,
- 2 → “Twice the module width”,
- …

You can use the Default Print Ratio ❶ as a template for a customized ***Print Ratio*** value. It shows how many different bar and space widths are used for the selected barcode type. The absolute width of a bar (or space) is calculated using the values of the print ratio multiplied with the module width.

Example: If a barcode element has 4 different bar widths and 4 different space widths, the print ratio could look like this (e.g. for Code 128): 1:2:3:4:1:2:3:4.
The first 4 numbers ("1:2:3:4") stand for the bar widths, the last 4 numbers for the space widths (in this case, they are the same). The smallest bar is "1" module wide, the next larger is "2" (thus twice as wide as the smaller bar) and so on.

- ► Modifications of the print ratio make only sense for special applications! E.g., for the Code 2OF5 interleaved the print ratio can vary from 1:2 to 1:3.
- ► Use this option with care! Barcodes may become unreadable when using wrong print ratios.

For additional information on print ratios, please refer to the “Barcode Reference” on www.tec-it.com.

## 7.9 Page Logos and Effects

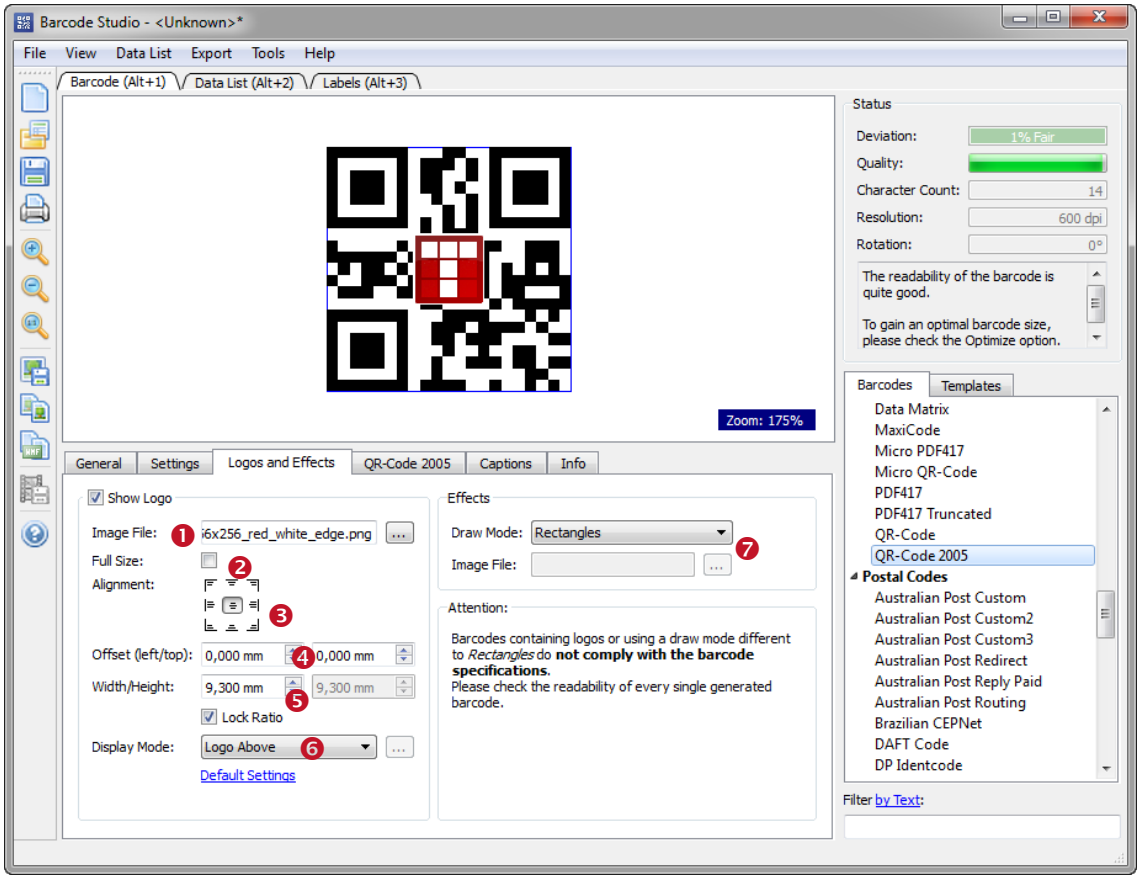



*Figure 21: Logos and Effects*

### 7.9.1 Logos

> ► **Attention:** The embedding of logos can **endanger** readability. We strictly recommend checking the readability of every single barcode.
> ► A change does make only sense for special applications like advertisements, fun barcodes, etc., that do not enforce the readability of the barcodes.

A logo can be displayed and changed only if “Show Logo” is checked.

#### 7.9.1.1 Image File

Selection of the logo image file in ❶.

#### 7.9.1.2 Full Size

If checked the logo is stretched to the full size of the barcode (❷). In order to gain a useful result, you should also choose a suitable display mode.

#### 7.9.1.3 Alignment

Defines the alignment and so the position of the logo within the barcode (❸).

#### 7.9.1.4 Offset

The offset specifies the relative horizontal and vertical distance of the logo from the position given by the alignment (❹).

#### 7.9.1.5 Width/Height, Lock Ratio

This setting defines the width and the height of the logo (❺). If “Lock Ratio” is checked, the ratio between width and height is retained when the size changes.

#### 7.9.1.6 Display Mode

The display mode (❻) specifies, how the logo shall be embedded into the barcode. You can choose among following options:

- Logo Above → The logo is drawn in front of the barcode.
- Logo Below → The logo is drawn behind the barcode.
- Mask → The logo is drawn only over the bars.
- Custom Settings → Detailed Settings by clicking ... (see *7.9.2 Custom Display Settings*)

#### 7.9.1.7 Default Settings

By clicking “Default Settings” all logo settings are reset to default.

### 7.9.2 Custom Display Settings

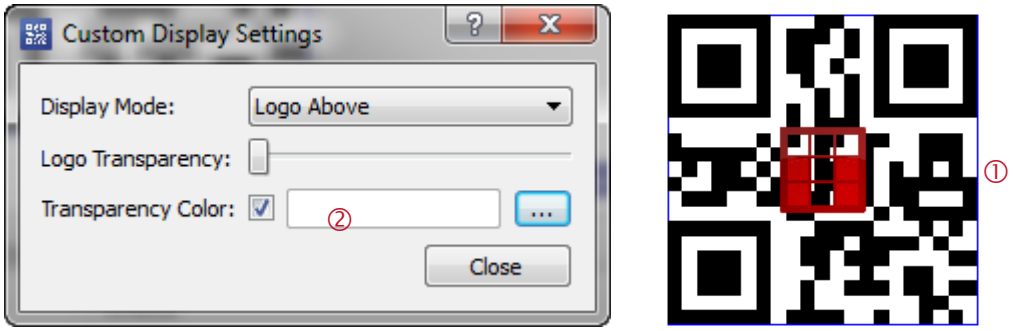



*Figure 22: Custom Display Settings*

#### 7.9.2.1 Display Mode

Set here the detailed display mode.

#### 7.9.2.2 Logo Transparency

This setting defines the transparency of the logo in the range between opaque and invisible.

#### 7.9.2.3 Transparency Color

Choosing of a single transparency color. If the selected color occurs in the logo, it is drawn transparently. (See also ① in Figure 22 – white was chosen as transparency color ②).

### 7.9.3 Effects

#### 7.9.3.1 Draw Mode

> ► **Attention:** For average use we strongly recommend to use **only** Draw Mode ***Rectangles***. Using another mode can **endanger** readability.
>
> ► A change does make only sense for special applications like advertisements, fun barcodes, etc., that do not enforce the readability of the barcodes.

The draw mode (❼) specifies which shape the bars should have. Usually bars are drawn as rectangles – only this selection applies to the barcode standards. For special applications (like advertisements, etc.) you can also choose other shapes.

| Draw Mode | Description |
|---|---|
| Rectangles | Standard. Bars are drawn as rectangles.<br>*Attention: For the average use we strongly suggest using only this setting.* |
| Circles/Ellipses | Bars are drawn as circles or ellipses depending on the outline of the bar. |
| Big Circles/Ellipses | Like above, but the circles or ellipses are drawn a bit bigger. In matrix codes the circles overlap which increases the readability of the barcode in comparison to the settings ***Circles/Ellipses***. |
| Rounded Rectangles | Bars are drawn as rectangles with rounded corners. |
| Images | Bars are drawn as images. The name of the image file must be set in field **Image File**. |

*Table 6: Draw Modes*

#### 7.9.3.2 Image File

If the user selects the drawing method Image, he has to enter the name of the image file (.bmp, .jpg, .gif, .png, .tif) here.

## 7.10 Page Captions

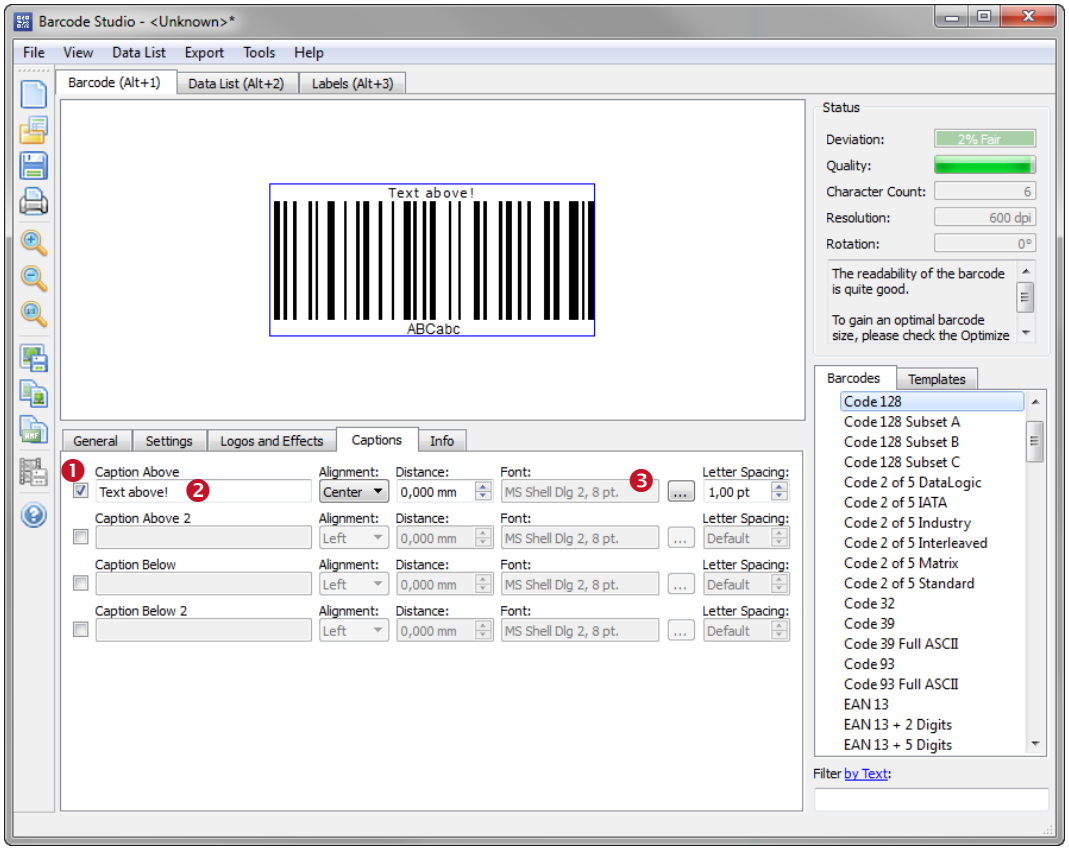



*Figure 23: Captions*

The texts which are specified here are printed above and below the barcode. Currently two captions above and two captions below the barcode are supported.

In order to print a caption, it must be activated. For each caption you can specify the content, the alignment, the text distance, and the font style.

### 7.10.1 Text Position

The checkboxes in ❶ allow you to activate one or more captions. The caption texts are printed in the following order (from top to bottom): *Caption Above, Caption Above 2,* barcode, *Caption Below, Caption Below 2*.

### 7.10.2 Text

In field ❷ you specify the caption text.

### 7.10.3 Alignment

This property adjusts the alignment of the human readable text (Left, Right, and Center).

### 7.10.4 Text Distance

This property specifies the distance to the next inner element: either to the barcode or to the next inner caption.

If the caption is adjacent to the barcode, then the *Distance* describes the space between the caption and the barcode. If an additional caption is located between the caption and the barcode, then the *Distance* describes the space between these two captions.

The distance may also be less than 0. So you can print captions within the barcode or on the same line with another caption.

### 7.10.5 Font

Click the … button to select the font for the caption text. The selected font is displayed in the text box ❸.

### 7.10.6 Letter Spacing

This property specifies the distance between two letters in points. The default value is 0.

## 7.11 Page Info

### 7.11.1 User Info

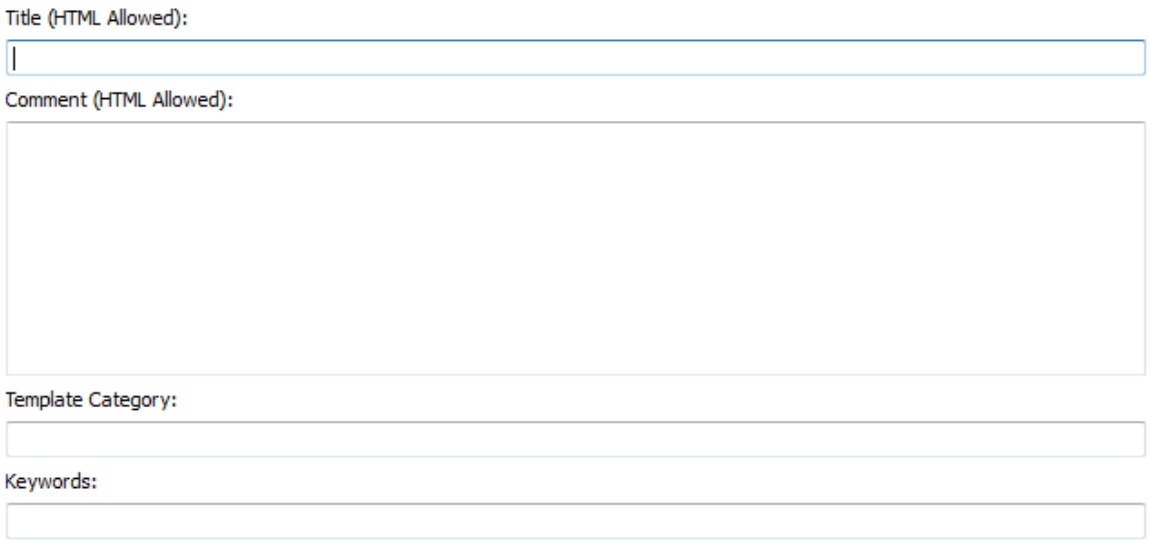



*Figure 24: User Info Section*

#### 7.11.1.1 Title and Comment

Users can enter a title and a comment in HTML-Format. If specified, the title and the comment are displayed as info text below the barcode. The info text can be used to provide other users with important information.

Possible fields of application:

- Give a short description of specific barcode settings.
- Provide information about the required input data format.
- Advice other users to perform the necessary steps for the generation of correct barcodes.
- …

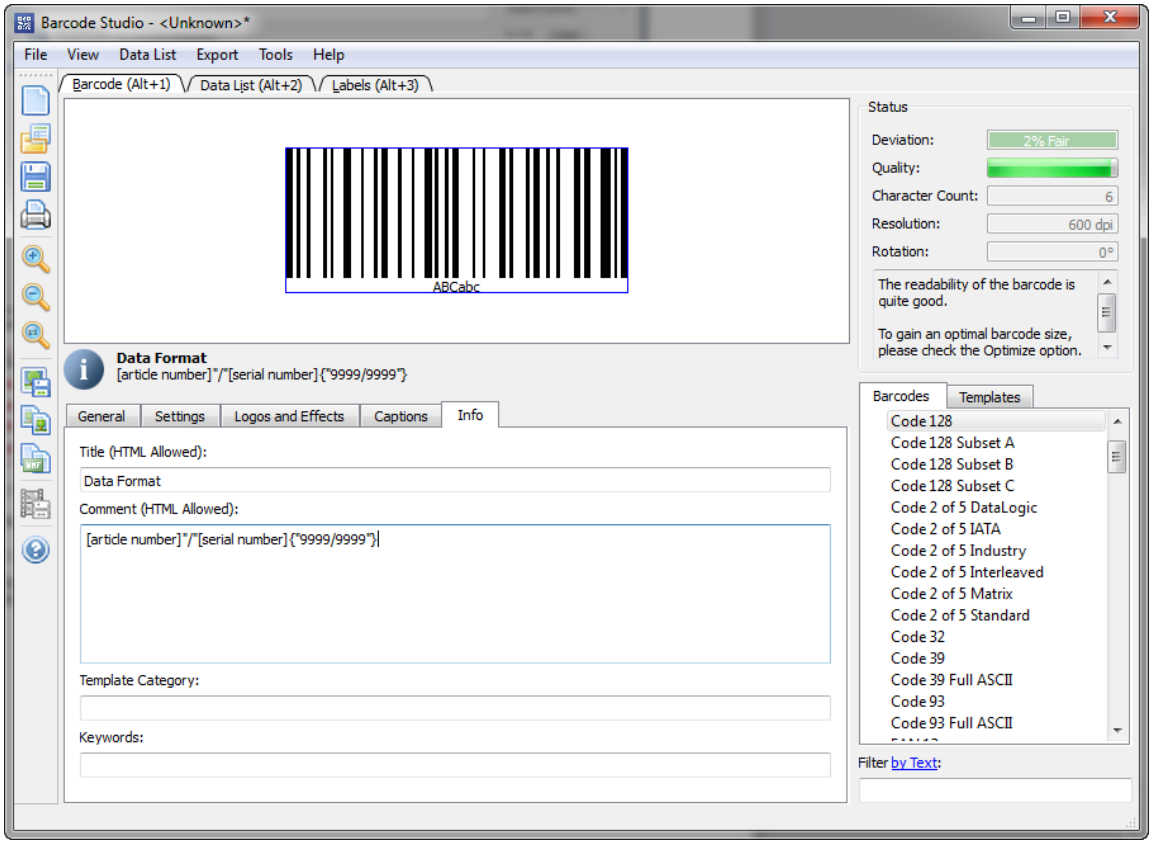



*Figure 25: Info Text*

To distribute settings with an info text, please perform following steps:

- ► Change all settings according to your needs.
- ► Enter the info text to the title/comment field.
- ► Save the settings to a file.
- ► Provide this file to all users who need it.

#### 7.11.1.2 Template Category

The template category is used for categorizing templates in the *Templates* tree.

#### 7.11.1.3 Keywords

The field *Keywords* contains information related to a template. It can be used as additional information for filtering the templates list.

## 7.12 2D Settings

### 7.12.1 PDF417 / Micro PDF417

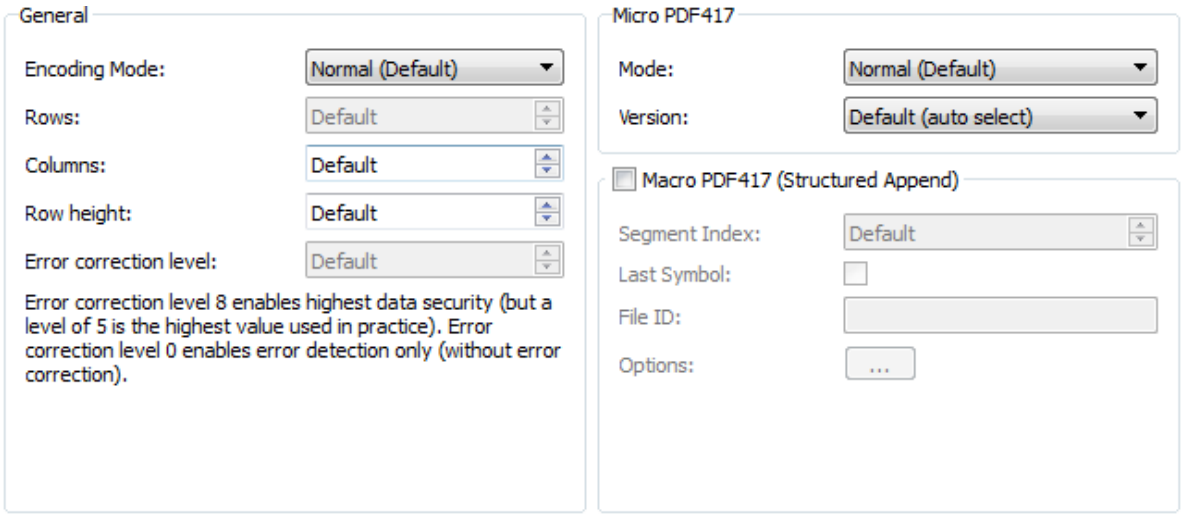



*Figure 26: PDF417 / Micro PDF417 Properties*

The PDF417 / Micro PDF417 page is used for modifying the standard behavior of the 2-dimensional barcode types PDF417, Micro PDF417 and for all derived barcodes (PDF417 Truncated, etc.). PDF417 divides the data content into rows and columns. It is a so called “stacked symbology” with error correction capabilities.

► Be careful when modifying these adjustments. Always make a test scan in case of doubt!

#### 7.12.1.1 Encoding Mode

Determine whether to enforce binary encoding. In **Binary Encoding** mode the encoding algorithm does not try to calculate the smallest possible symbol, but it uses binary encoding for all characters. This is recommended for binary input data and for barcode generation with optimal speed.

#### 7.12.1.2 Rows [3..90]

The number of rows. This value must be between 3 and 90.

Default: The number of lines is calculated automatically based on the number of input characters.

► This property is not available for the Micro PDF417 symbology!

#### 7.12.1.3 Columns [1..30]

The number of columns. The value must be between 1 and 30. Start-, stop- and line-indicator columns are not taken into account.

Default: The number of columns is calculated automatically based on the number of input characters.

#### 7.12.1.4 Row Height [mm]

The height of an individual row in millimeters. If specified, the barcode height will remain locked at the specified value. (Modifying the barcode dimensions will only affect the barcode width.)

Default: The row height is calculated automatically based on the number of input characters.

#### 7.12.1.5 Error Correction Level

The error correction level. The value can be between 0 (only error detection) and 8 (highest correction).

Default: The level is calculated automatically according to the number of input characters (minimum 2, maximum 5).

► This property is not available for the Micro PDF417 symbology!

#### 7.12.1.6 Mode

Specifies how data is encoded as Micro PDF417. In most cases the “Default” mode is the best choice.

► Note: Often the scanner hardware does not support all modes listed below. – Please, check with your scanner first.

| Mode (Enumeration) | Description |
|---|---|
| Normal (Default) | The input data is analyzed. Text, numeric or binary compaction mode will be used accordingly (to generate the smallest symbol). |
| UCC/EAN-128 Emulation | UCC/EAN-128 Emulation mode. Transmit ]C1 or ]L3.<br>Use compaction for Application Identifier (AI) "01" + 14 digits. |
| Code128 Emulation | Code-128 Emulation mode. Transmit ]C2 or ]L4. |
| Code128 FNC2 Emulation | Code-128 with FNC2 on first position will be emulated. |
| Linked UCC/EAN-128 | Linked UCC/EAN-128 emulation. Transmit ]C1 or ]L3.<br>Indicates that the Micro PDF symbol is linked with a linear symbol (which may be required for a successful scan).<br>Using this mode, the following AIs can be encoded with better compaction in the given order:<br>▪ Date (AI 11, 13, 15 or 17) + lot number (AI 10) + other AI’s (optional).<br>▪ Date (AI 11, 13, 15 or 17) + serial number (AI 21) + other AI’s (optional).<br>▪ Date (AI 11, 13, 15 or 17) + other AI’s (optional).<br>Note: This mode is not used with UCC EAN Composite Symbology (which uses linked symbols, too). |
| 05 Macro | The preamble [ ( > RS 0 5 GS precedes the encoded data. |
| 06 Macro | The preamble [ ( > RS 0 6 GS precedes the encoded data. |
| CC-A Data Mode | For special applications only: use Base-928 compaction and process input data as byte array. |
| CC-B Data Mode | For special applications only: use binary compaction (Base-900), prefix symbol data with reserved symbology code word. |

*Table 7: Micro PDF417 – Modes*

► This property is not available for the PDF417 symbology!

#### 7.12.1.7 Version

Specifies the “size” of the symbol in terms of code word-columns and Micro PDF417 rows.

► This property is not available for the PDF417 symbology!

#### 7.12.1.8 Macro PDF417 (Structured Append)

Inserts a Macro PDF control block into the barcode.

PDF417 allows the user to spread the data across several symbols. This might be done if the data is too large to fit into a single symbol or for reasons of appearance and geometry.

The so called “Macro PDF Control Block” carries information that relates its contents to the overall data. The properties described below are mandatory for the Macro PDF functionality.

#### 7.12.1.9 Segment Index

Index of the actual data segment in the symbol chain. It starts with 1 and is increased for each additional symbol in the data chain. Value range = 1…99999.
Note: when reading the encoded data with a scanner, the index will be zero-based.

#### 7.12.1.10 Last Symbol

Identifies the last symbol in the data chain. If set to true, the “Last Segment Indicator” is put at the end of the Macro PDF control block.

#### 7.12.1.11 File ID

The file id identifies all symbols, which belong to the same data chain. For reassembling, all data blocks having the same File ID are concatenated in the order of increasing segment index.

#### 7.12.1.12 Optional Settings

These fields are *optional* and may be encoded into the Macro PDF417 control block on demand.

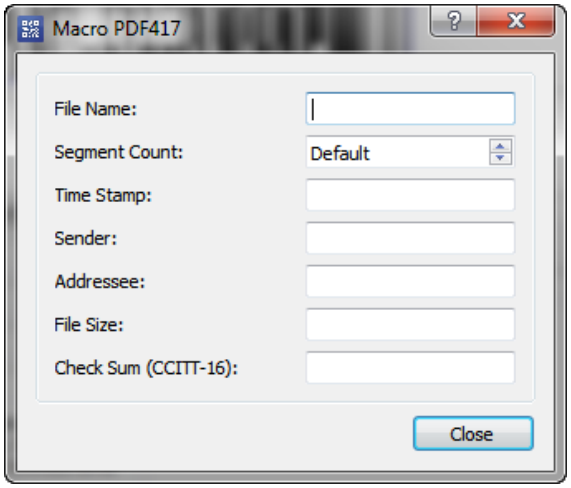



*Figure 27: Macro PDF417 – Optional Settings*

| | |
|---|---|
| **File name (alphanumeric)** | File name (variable length field). |
| **Segment count (numeric)** | Total number of data segments (range 1…99999). |
| **Time stamp (numeric)** | Time stamp (elapsed time in seconds since January 1, 1970 00:00 GMT). |
| **Sender (alphanumeric)** | Sender (variable length field). |
| **Addressee (alphanumeric)** | Addressee (variable length field). |
| **File size (numeric)** | Total number of bytes encoded (variable length field). |
| **Checksum (numeric)** | 16-Bit CRC checksum (using CCITT-16 polynomial x16 + x12 + x5 + 1 over the entire data). |

### 7.12.2 MaxiCode

MaxiCode represents data, by drawing hexagonal items, which are arranged around a circular center (a so called "Bull's Eye"). The internal data structure is regulated by different "modes". The mode "Structured Carrier Message" was defined by the parcel transport service UPS®. Data can be

encoded in two different error correction levels (SEC = Standard Error Correction and EEC = Enhanced E.C.).

With “Structured Append” you can divide larger quantities of data into several MaxiCode symbols – they are joined by the scanner. The maximum data capacity of one symbol is 93 characters. The actual quantity of the utilizable data depends on the selected mode, on the amount of special characters, on whether compressible numeric sequences are used and on the level of error correction.

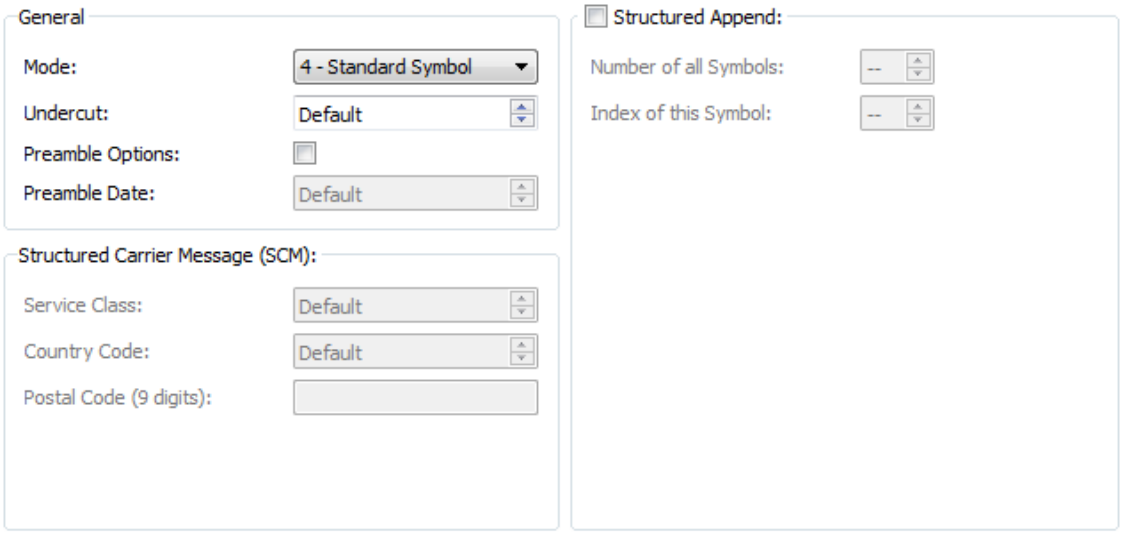



*Figure 28: MaxiCode Properties*

#### 7.12.2.1 Mode

| Mode (Enumeration) | Description |
|---|---|
| 4 – Standard Symbol | For numeric and alphanumeric character sequences (incl. standard error correction). |
| 2 – SCM (Numeric) | Structured Carrier Message, up to 9 digits (postal code consist of digits only). |
| 3 – SCM (Alphanumeric) | Structured Carrier Message, up to 6 characters (postal code consist of alphanumeric characters). |
| 5 – Full EEC | Like mode 4 but with enhanced error correction (safer, but fewer utilizable data possible). |

*Table 8: MaxiCode – Modes*

#### 7.12.2.2 Undercut [0..100]

The undercut influences the diameter of the hexagonal barcode elements. In new applications it is recommended (according to the AIM standard) to use an undercut setting of 75% (default).

#### 7.12.2.3 Preamble Options

Used particularly in “Open System Standards”. Under “Preamble Date” the last two digits of a year can be entered. They are inserted automatically into the data stream in a predefined place.

#### 7.12.2.4 Structured Append

If you want to encode large quantities of data you can “connect” several MaxiCode symbols by the use of “Structured Append". For each MaxiCode symbol an identification number must be assigned. This number is entered in the field “Index of this Symbol” and can range from 1 to 8. The index indicates the order, in which the data is joined after the reading/scanning process. The total number of arranged MaxiCode symbols must be entered in “Number of all symbols”.

#### 7.12.2.5 Structured Carrier Message (SCM)

MaxiCode was originally developed by UPS® (United Parcel Service). The operating mode "Structured Carrier Message" (mode 2 and 3) supplies special data fields for UPS®-purposes: ”Service Class”, ”Country Code”, and ”Postal Code”. In “Mode 3” you can use digits as well as alphanumeric characters for the “Postal Code”.

By using escape sequences it is possible to insert the values for date, preamble, service class, country and postal code directly into the barcode data (text property). To learn more about this feature, please refer to the additional document “Barcode Reference”, which is available from www.tec-it.com or via the menu *Help ► Barcode Reference*.

### 7.12.3 Data Matrix

► Please note, that **Barcode Studio** always uses ECC 200 error correction.

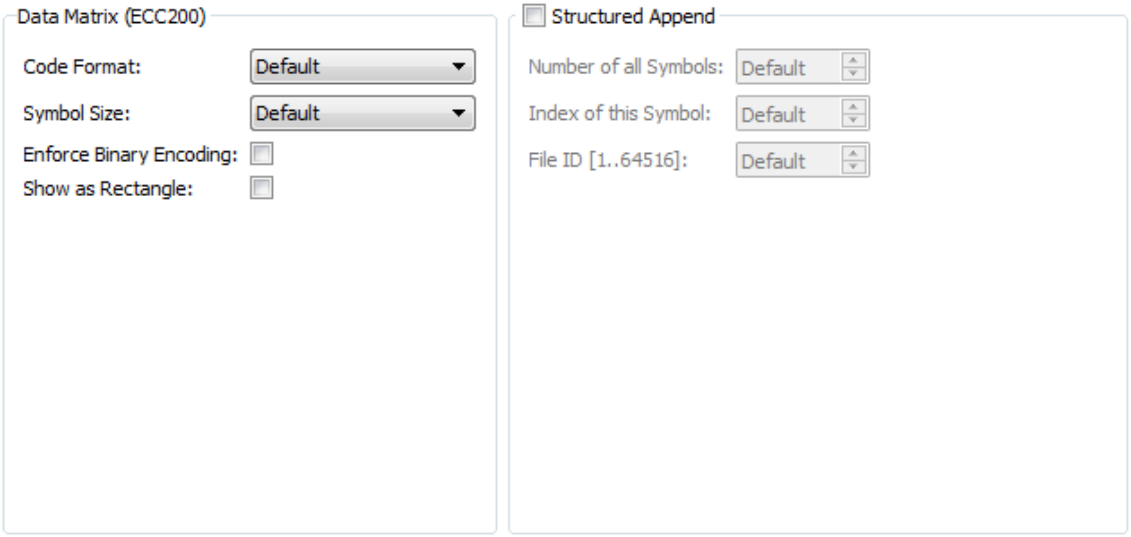



*Figure 29: Data Matrix (ECC200) Properties*

#### 7.12.3.1 Code Format

| Code Format (Enumeration) | Description |
|---|---|
| Default | Standard format. |
| GS1/UCC/EAN | Special format defined by GS1/UCC/EAN. Used for encoding Application Identifiers. (FNC1 at 1st position). |
| Industry | Supports peculiar industry formats (FNC1 at 2nd position). |
| Format 05 | []>Rs05Gs is encoded at the beginning of the code. |
| Format 06 | []>Rs06Gs is encoded at the beginning of the code. |
| Reader Programming | Format used to program barcode reading devices. |
| DP Postmatrix | Special Format defined by „Deutsche Post“. Is used for mailing commercials. |

*Table 9: Data Matrix – Modes*

#### 7.12.3.2 Symbol Size

The size of the symbols in number of rows and columns. Possible sizes are "10 x 10" to "144 x 144" modules for square symbols and "8 x 18" to "16 x 48" for rectangular symbols. If set to default, the minimal possible square size is used (depending on the input data).

#### 7.12.3.3 Enforce Binary Encoding

Determine whether to enforce binary encoding. In **Binary Encoding** mode the encoding algorithm does not try to calculate the smallest possible symbol, but it uses binary encoding for all characters. This is recommended for binary input data and for barcode generation with optimal speed.

#### 7.12.3.4 Show as Rectangle

Determines if the Data Matrix symbol should be displayed as rectangle (checked) or as square (unchecked; default).

#### 7.12.3.5 Structured Append

If you want to encode large quantities of data you can “connect” several Data Matrix symbols by the use of “Structured Append". For each Data Matrix symbol an identification number must be assigned. This number is entered in the field “Index of this Symbol” and can range from 1 to 16. The index indicates the order, in which the data is joined after the reading/scanning process. The total number of arranged Data Matrix symbols must be entered in “Number of all symbols”. The “File ID” has to be the same for all symbols within such a chain.

### 7.12.4 QR-Code / QR-Code 2005 / Micro QR-Code

The QR-Code symbology is a 2-dimensional matrix symbology (similar to Data Matrix). Remarkable is the large data capacity (up to 3000 ASCII characters or 7000 digits). QR-Code means Quick Response code – it was originally designed to read and decode symbols with high amounts of data within a minimum of time. The only difference between QR-Code and QR-Code 2005 is the default code page. Whereas QR-Code uses *Japanese Shift-JIS*, QR-Code 2005 uses *ISO 8859-1 Latin I*.

The Micro QR-Code symbology is based upon QR-Code, but is adapted to encode only small quantities of data. It produces less overhead and smaller symbols.

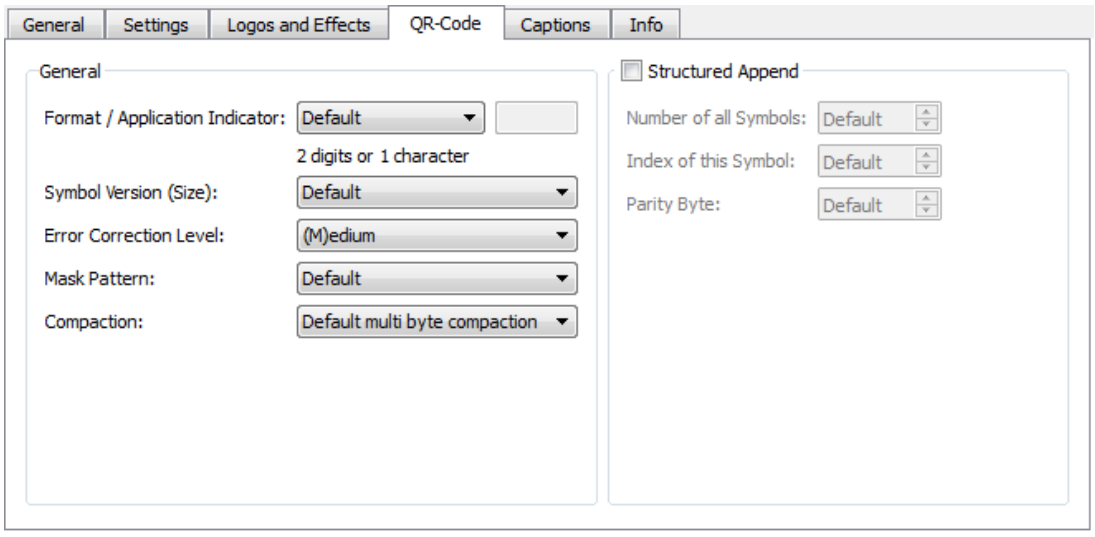



*Figure 30: QR-Code Properties*

#### 7.12.4.1 Format / Application Indicator

| Format (Enumeration) | Description |
|---|---|
| Default | Standard format. |
| GS1/UCC/EAN | Special format defined by GS1/UCC/EAN. Used for encoding Application Identifiers. (FNC1 at 1st position). |
| Industry | Supports certain industry formats (FNC1 at the second position). If you choose this value, you also have to fill in the field Application Indicator (2 digits or 1 letter). It determines to which industry format the input data corresponds. |

*Table 10: QR-Code – Modes*

► This property is not available for the Micro QR-Code symbology!

#### 7.12.4.2 Symbol Version (Size)

The version (= size) of the symbol is specified by a version number, the number of rows and the number of columns. The range for QR-Code symbols is from *(1) 21 x 21* up to *(40) 177 x 177* modules. The range for Micro QR-Code symbols is from *(M1) 11x11* to *(M4) 17x17*.

If the property is set to default, the size is computed automatically based on the data to be encoded.

#### 7.12.4.3 Error Correction Level

Defines the error correction level. You can choose from the following values:

| Error Correction Level (Enumeration) | Description |
|---|---|
| (L)ow | Lowest level. Data recovery capacity is up to approximately 7%. |
| (M)edium (default) | Up to 15%. |
| (Q)uartil | Up to 25%. |
| (H)igh | Highest level. Up to 30%. |

*Table 11: QR-Code – Error Correction Levels*

► Not all versions (sizes) of the Micro QR-Code support all levels of error correction. If you have selected a level, which is too high for the given symbol version, **Barcode Studio** automatically uses the highest possible level.

#### 7.12.4.4 Mask Pattern

Specifies the mask pattern that is applied to the symbol to improve the readability of the code.

| Mask Pattern (Enumeration) | Description |
|---|---|
| Default | The mask pattern is calculated automatically. |
| 0..7 (QR-Code only) | With the values 0 to 7 you choose the appropriate mask pattern. It would make sense to specify this setting directly if you have to optimize the computation time. The algorithm to calculate the optimal mask is rather complex (and therefore very resource consuming). |
| 0..3 (Micro QR-Code only) | With the values 0 to 3 you choose the appropriate mask pattern. It would make sense to specify this setting directly if you have to optimize the computation time. Compared to QR-Code the mask algorithm for Micro QR-Code is rather fast and simple. |

*Table 12: QR-Code – Mask Patterns*

#### 7.12.4.5 Compaction

The multi-byte compaction mode. QR-Code provides code compaction for various Multi Byte character encodings (Kanji, Chinese). This compaction can help to produce smaller barcodes.

| Compaction (Enumeration) | Description |
|---|---|
| Default multi byte compaction (Default) | Automatically chooses the appropriate compaction method. |
| No multi byte compaction | Disables the multi byte compaction. |
| Kanji character compaction | Enables the compaction for Kanji characters. |
| Chinese character compaction | Enables the compaction for Chinese characters. |

*Table 13: QR-Code – Compaction*

QR-Code supports compaction of Kanji characters (if present in the Multi Byte character set Shift JIS X 0208). The Kanji characters are compacted into a 12-Bit code word (instead of a 2 Byte / 16 Bit code word) – so they need less space in the symbol. It is recommended to enable this compac-

tion only if you have Kanji characters in your input data. This mode should not be enabled for binary data!

#### 7.12.4.6 Structured Append

If you want to encode large quantities of data, you can “connect” several QR-Code symbols by the use of “Structured Append”. For each QR-Code symbol you have to assign a symbol identification number which is entered in the field “Index of this Symbol”. Its value can range from 1 to 16. This index indicates the order, in which the data is joined after the reading/scanning process. The total number of arranged symbols must be entered in “Number of all Symbols”.

Chained QR-Code symbols are identified by the parity byte. The parity byte must be identical in all symbols. The value can be calculated using the method „QR_StructAppParity“, which is part of **TBarCode** API.

► This property is not available for the Micro QR-Code symbology!

### 7.12.5 Aztec Code

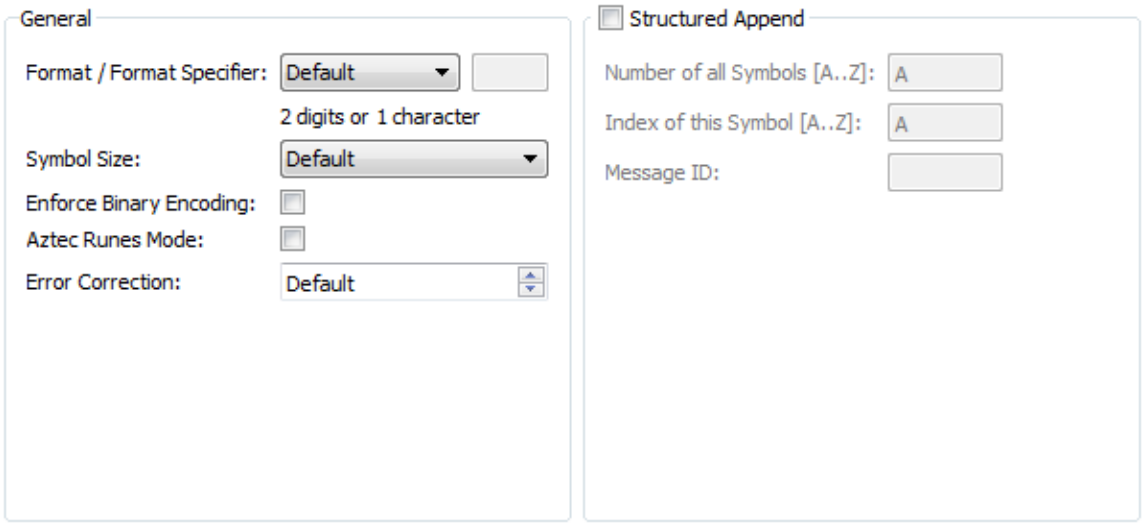



*Figure 31: Aztec Code Properties*

#### 7.12.5.1 Format / Format Specifier

| Code Format (Enumeration) | Description |
|---|---|
| Default | Standard format. |
| GS1/UCC/EAN | Special format defined by GS1/UCC/EAN. Used for encoding Application Identifiers. (FNC1 at 1st position). |
| Industry | Supports certain industry formats (FNC1 at the second position). If you choose this value, you also have to fill in the field Application Indicator (2 digits or 1 letter). It determines to which industry format the input data corresponds. |

*Table 14: Aztec Code – Modes*

#### 7.12.5.2 Symbol Size

Defines the size of the symbol in rows and columns. Possible values range from „15 x 15" up to „151 x 151" modules. If the property is set to default, the size is computed automatically based on the data to be encoded.

#### 7.12.5.3 Enforce Binary Encoding

Specifies whether to enforce binary encoding. In **Binary Encoding** mode the encoding algorithm does not try to calculate the smallest possible symbol, but it uses binary encoding for all characters. This is recommended for binary input data and for barcode generation with optimal speed.

#### 7.12.5.4 Aztec Runes Mode

Enables the Aztec Runes mode. Aztec Runes are a special kind of Aztec Code symbols and are used to generate small and very fast readable markers. Aztec Runes can only encode integer values from 0 to 255.

#### 7.12.5.5 Error Correction

Defines the error correction level in percent. You can enter a value between 1 and 89 percent. The value “Default” is equivalent to 23 percent.

#### 7.12.5.6 Structured Append

If you want to encode large quantities of data you can “connect” several Aztec Code symbols by the use of “Structured Append". For each Aztec Code symbol an identification number must be assigned. This number is entered in the field “Index of this Symbol [A..Z]” and can range from “A” to “Z”. The index indicates the order, in which the data is joined after the reading/scanning process. The index of the last symbol must be entered in “Number of all Symbols [A..Z]”.

Chained Aztec Code symbols are identified by the “Message ID”. The “Message ID” must be identical in all symbols.

### 7.12.6 Codablock-F

The Codablock-F property page is used to adjust symbology specific parameters. Similar to PDF-417 the data content is divided into rows and columns. Codablock-F is a stacked symbology with additional internal checksums for error recognition.

Codablock-F is based upon the Code 128 symbology – one data row consists of a single Code 128 barcode, which is extended by a row identifier and a column check sum.

► Have caution when modifying these adjustments. Always make a test scan in case of doubt!

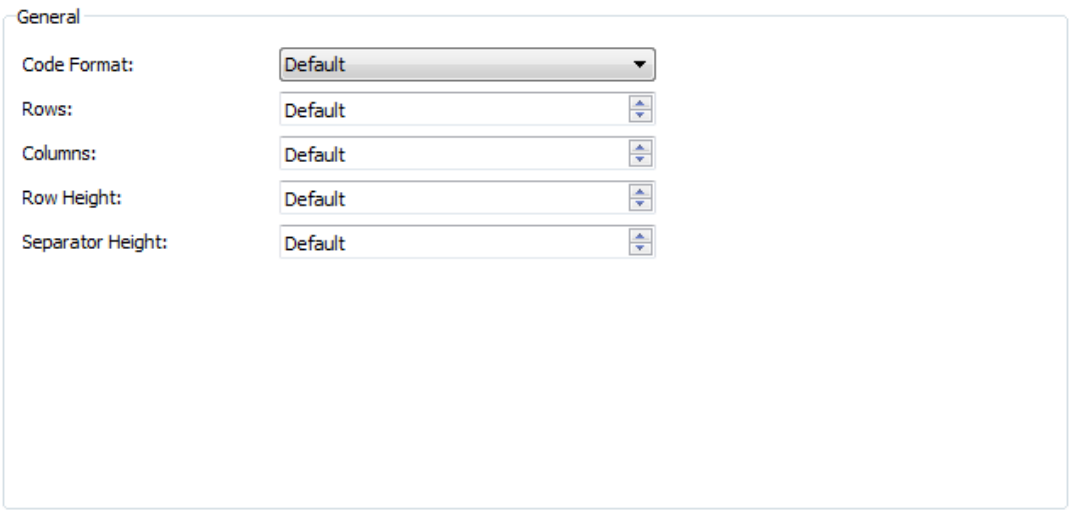



*Figure 32: Codablock-F Properties*

#### 7.12.6.1 Code Format

| Code Format (Enumeration) | Description |
|---|---|
| Standard | Standard format |
| GS1/UCC/EAN | Special format defined by GS1/UCC/EAN to be used in GS1/UCC/EAN applications. |

*Table 15: Codablock-F – Modes*

#### 7.12.6.2 Rows [2..44]

The number of rows. The value must be between 2 and 44.

Default: the number of lines is calculated automatically based on the number of input characters.

#### 7.12.6.3 Columns [4..62]

The number of columns (in data words). The value must be between 4 and 62. Start-, stop- and line-indicator columns are not taken into account.

Default: the number of columns is calculated automatically based on the number of input characters.

#### 7.12.6.4 Row Height [mm]

The height of an individual row in millimeter. If specified, the barcode height will remain locked at the specified value. (Modifying the barcode dimensions will only affect the barcode width.)

Default: the row height is calculated automatically based on the number of input characters.

#### 7.12.6.5 Separator Height [mm]

The width of the row separator line in millimeter.

Default: the line width is equal to the module width (calculated automatically based on the symbol size).

### 7.12.7 Composite Symbology

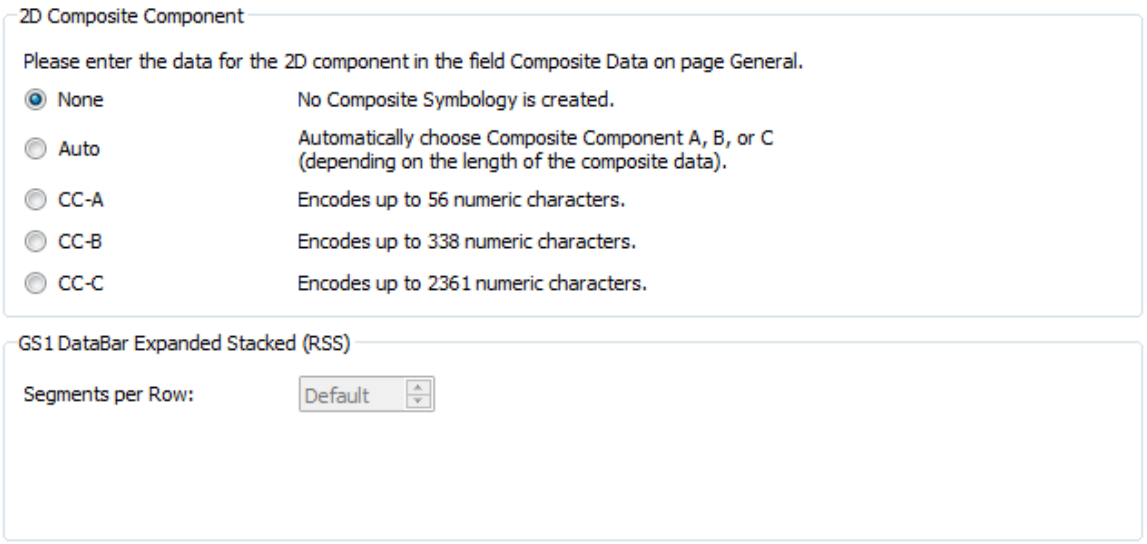

2D Composite Component
Please enter the data for the 2D component in the field Composite Data on page General.
None
No Composite Symbology is created.
Auto
Automatically choose Composite Component A, B, or C (depending on the length of the composite data).
CC-A
Encodes up to 56 numeric characters.
CC-B
Encodes up to 338 numeric characters.
CC-C
Encodes up to 2361 numeric characters.
GS1 DataBar Expanded Stacked (RSS)
Segments per Row:
Default

*Figure 33: Composite Symbology Settings*

Composite components are available for the following barcodes:

- EAN8
- EAN13
- GS1-DataBar / RSS14
- GS1 DataBar Stacked / RSS14 Stacked
- GS1 DataBar Stacked Omnidirectional / RSS14 Stacked Omnidirectional
- GS1 DataBar Truncated / RSS14 Truncated
- GS1 DataBar Expanded / RSS Expanded
- GS1 DataBar Expanded Stacked / RSS Expanded Stacked
- GS1 DataBar / RSS Limited
- GS1-128 / UCC/EAN128
- UPC-A
- UPC-E

► By default Composite Component Symbologies are *disabled*.

#### 7.12.7.1 2D Composite Component

| | |
|---|---|
| None | Composite Symbologies are disabled. |
| Auto | Automatically choose CC-A, CC-B or CC-C Symbology depending on the length of the composite data. |
| CC-A | CC-A is a variant of the MicroPDF417 Symbol with a unique combination of row address patterns (RAP). CC-A is the smallest variant of the 2-dimensional composite component. Up to 56 digits of alphanumeric data can be coded with 3 to 12 rows and 4 columns. |
| CC-B | CC-B is a subset of the MicroPDF417 Symbol, which is identified by the code word 920. The encoding algorithm chooses CC-B automatically when CC-A has not enough capacity (Auto-mode). CC-B encodes up to 338 digits of alphanumeric data in 3 to 12 rows and 2 to 4 columns. |
| CC-C | The CC-C structure is a PDF417 Symbol, which is identified by the internal code word 920 (920 is the first code word after the symbol length indicator). The CC-C structure can be used as a 2 dimensional composite component of a UCC/EAN-128 Composite Symbols. It has the largest data capacity of EAN.UCC Composite Symbols. It can encode up to 2361 alphanumeric characters in 3 to 30 rows and up to 30 Data-Error-checking-Code-Columns. |

#### 7.12.7.2 Segments per Row

This property adjusts the number of (graphical data) segments per row in the ***GS1 DataBar Expanded Stacked (RSS)*** Symbol. This parameter influences the width of the barcode. “Default” means that each row contains at least 4 segments.

► This property is only used by the **GS1 DataBar Expanded Stacked (RSS)** barcode symbology.

### 7.12.8 DotCode

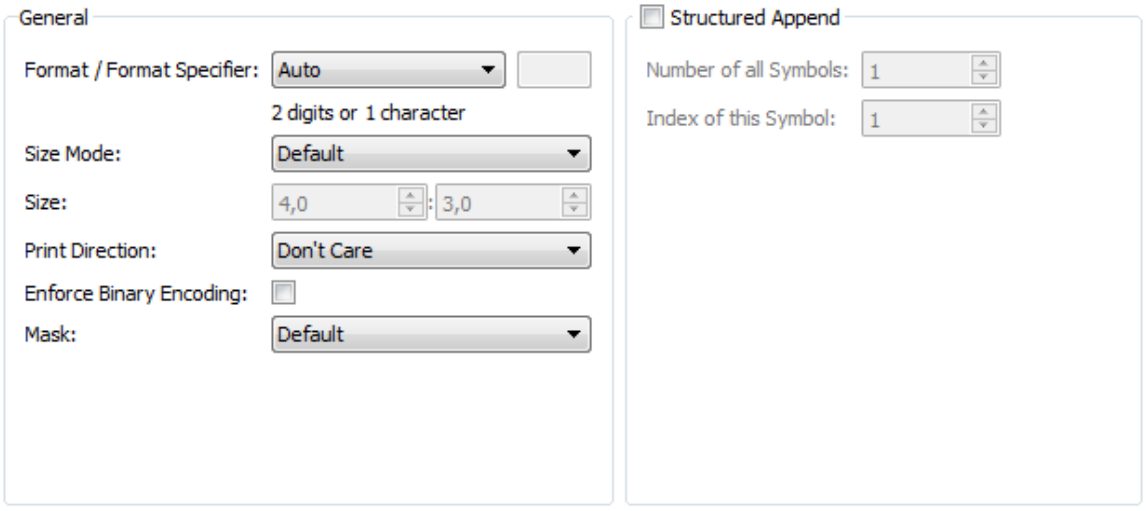



*Figure 34: DotCode Settings*

#### 7.12.8.1 Format / Format Specifier

| Code Format (Enumeration) | Description |
|---|---|
| Auto | Auto discriminate the format based on the barcode data.<br>If the data starts with 2 digits, barcode is in GS1 format, otherwise generic data is assumed. |
| Generic | Generic data format, which means data with no special format, is used. If barcode data starts with 2 digits, FNC1 is automatically inserted at first position. |
| GS1 | Special format defined by GS1 that is used for encoding Application Identifiers. Barcode data must start with 2 digits. |
| Industry | Supports certain industry formats (FNC1 at the second position). If you choose this value, you also have to fill in the field Application Indicator (2 digits or 1 letter). It determines to which industry format the input data corresponds. |
| Macro 05 | []>Rs05Gs is encoded at the beginning of the code. |
| Macro 06 | []>Rs06Gs is encoded at the beginning of the code. |
| Macro 12 | []>Rs12Gs is encoded at the beginning of the code. |
| Custom Macro | []>Rs is encoded at the beginning of the code. Missing digits and control characters (like Gs, etc.) have to be added by the user. |
| Reader Programming | Format used to program barcode reading devices. |

*Table 16: DotCode – Modes*

#### 7.12.8.2 Size Mode - Size

The combination of the fields *Size Mode* and *Size* specifies the number of rows and columns of the barcode. The name of the *Size* field changes in dependence of the size mode.

| Size Mode | Size Field Name | Description |
|---|---|---|
| Default | -- | Use the default aspect ratio between number of columns and rows. Default value is 3:2. |
| Ratio Width/Height | Ratio Width/Height | Specify the aspect ratio between number of columns and rows. |
| Fixed Width | Number of Columns | Set a fixed number of columns. |
| Fixed Height | Number of Rows | Set a fixed number of rows. |
| Fixed Width/Height | Number of Columns/Rows | Set a fixed number of columns and rows. |

*Table 17: DotCode – Symbol Size*

#### 7.12.8.3 Print Direction

The generation of a DotCode symbol can be optimized for the print direction of a printer, with the moving direction of the printer head understood. This makes sense when a poor printing quality can be expected. Otherwise we suggest the user to set this field to *Don't Care*.

> ► This setting is applied only if neither the *number of columns* nor *the number of rows* of the symbol is fixed.

#### 7.12.8.4 Enforce Binary Mode

Specifies whether to enforce binary encoding. In **Binary Encoding** mode the encoding algorithm does not try to calculate the smallest possible symbol, but it uses binary encoding for all characters. This is recommended for binary input data and for barcode generation with optimal speed.

#### 7.12.8.5 Mask

Specifies the mask pattern that is applied to the symbol to improve the readability of the code. By default the mask is calculated automatically but it would make sense to specify this setting directly if you have to optimize the computation time.

With the values *Mask 0* to *Mask 3* you choose the appropriate mask pattern.

#### 7.12.8.6 Structured Append

If you want to encode large quantities of data, you can "connect" several DotCode symbols by the use of *Structured Append*. For each DotCode symbol you have to assign a symbol identification number which is entered in the field *Index of this Symbol*. Its value can range from 1 to 35. This index indicates the order, in which the data is joined after the reading/scanning process. The total number of arranged symbols must be entered in *Number of all Symbols*.

### 7.12.9 Han Xin Code

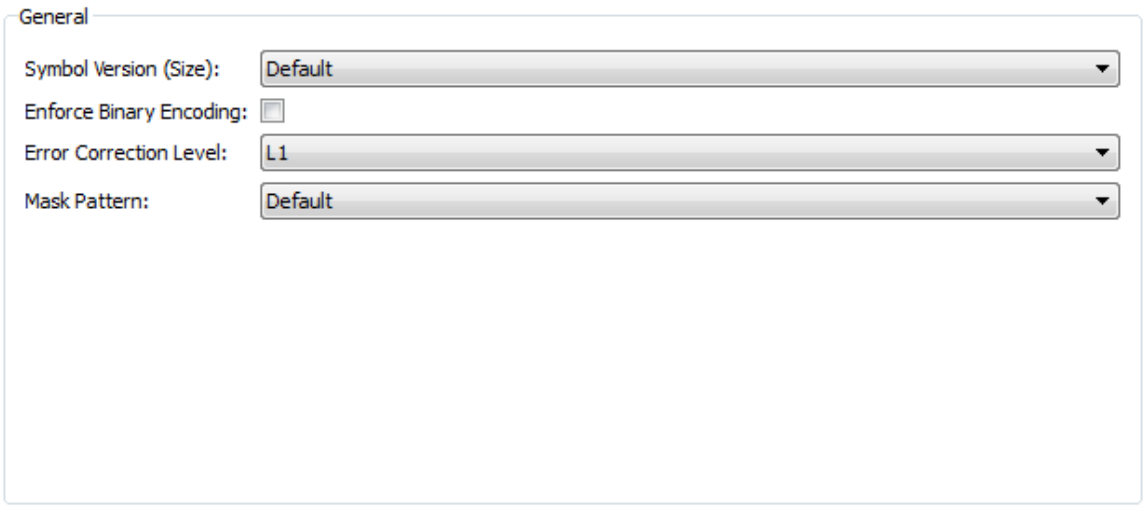



*Figure 35: Han Xin Settings*

#### 7.12.9.1 Symbol Version (Size)

The version (= size) of the symbol is specified by a version number, the number of rows and the number of columns. The range for DotCode symbols is from *(1) 23 x 23* up to *(84) 189 x 189* modules.

If the property is set to default, the size is computed automatically based on the data to be encoded.

#### 7.12.9.2 Enforce Binary Mode

Specifies whether to enforce binary encoding. In **Binary Encoding** mode the encoding algorithm does not try to calculate the smallest possible symbol, but it uses binary encoding for all characters. This is recommended for binary input data and for barcode generation with optimal speed.

#### 7.12.9.3 Error Correction Level

Defines the error correction level. You can choose from the following values:

| Error Correction Level (Enumeration) | Description |
|---|---|
| L1 | Lowest level. Data recovery capacity is up to approximately 8%. |
| L2 | Up to 15%. |
| L3 | Up to 23%. |
| L4 | Highest level. Up to 30%. |

*Table 18: QR-Code – Error Correction Levels*

#### 7.12.9.4 Mask Pattern

Specifies the mask pattern that is applied to the symbol to improve the readability of the code. By default the mask is calculated automatically but it would make sense to specify this setting directly if you have to optimize the computation time.

With the values *Mask 0* to *Mask 3* you choose the appropriate mask pattern.

# 8 Data List

## 8.1 General

In order to administrate series of barcode data, you can use the data list feature.

After performing the barcode settings (chapter 7 Barcode Studio User Interface) you can produce a series of barcode images (chapter 8.5 Export) or print barcode labels (chapter 9 Label Printing).

The data can be

- imported from a file,
  (chapter 8.3 File Import)
- generated by a sequence generator,
  (chapter 8.4 Sequence Generator)
- edited manually by the user,
  (chapter 8.2 Data List View)

Go to the *Data List* tab to see the following view:

## 8.2 Data List View

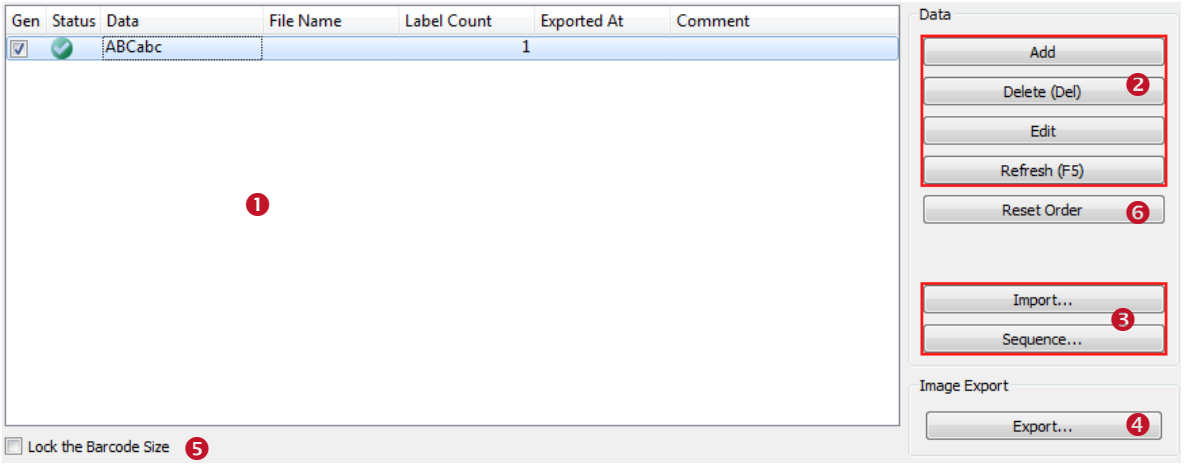



*Figure 36: Data List View*

The data list ❶ contains a list of barcode data, which can be used for exporting a series of barcode images or for printing labels. The data can be inserted, updated or deleted (❷), imported from a text file or generated automatically by a sequence generator (❸). The image export is done via the button ❹. For more information on label printing please go to chapter 9 Label Printing.

### 8.2.1 List Content

#### 8.2.1.1 Generate

The column “Gen.” (for Generate) determines whether a data row shall be exported or not. This value is checked by default.

#### 8.2.1.2 Status

The column “Status” informs the user whether a barcode can be created successfully ( – the data is valid for the given settings) or not ( ).

To get a detailed error message select the data row with the error icon. The error message is shown in the **Barcode View** above.

#### 8.2.1.3 Data

This column contains the barcode content. This value is mandatory for barcode generation. Values can be edited manually, imported from a file or generated with the sequence generator.

#### 8.2.1.4 Composite Data

“Composite Data” contains the content of the composite part of a barcode. It is only used in connection with composite barcode types. So the column is only visible if a composite barcode type is selected. The data can be edited manually or imported from a file.

#### 8.2.1.5 Captions

The caption columns contain those texts that are printed above or below the barcode. The columns are only visible if the according caption field is activated in the caption tab (on page Barcode). The following caption fields are available: **Caption Above**, **Caption Above 2**, **Caption Below**, **and Caption Below 2**. The captions can be edited manually or imported from a file.

#### 8.2.1.6 File Name

This column contains the name of the exported file. The file names can be edited manually, imported from a file, or generated automatically during export.

#### 8.2.1.7 Label Count

Here you can set, how many labels are printed for this data row. This value effect on exporting images.

#### 8.2.1.8 Exported At

The column “Exported At” contains the time when the barcode was successfully exported last time. It is generated automatically during export and cannot be changed by the user.

#### 8.2.1.9 Comment

The user may enter comments for the data list here.

### 8.2.2 Symbol Size / Module Width

By default all barcodes in the data list have the same module width. That means barcodes with different contents may vary in size but the minimum bar width (= the module width) and the quality will be the same for each barcode.

The user also has the possibility to generate barcodes with (nearly) the same symbol size (but different module width). He can do this by checking the field *Lock Symbol Size* ❺.

### 8.2.3 Order

You can order the data list by clicking on one of the header columns. With the first click the list will be sorted in ascending order by the content of the respective column, when clicking again the order is changed to descending. When clicking the button *Reset Order* ❻ the order is reset.

The actual order is used for label printing, too. See also chapter 9 Label Printing.

### 8.2.4 Editing

#### 8.2.4.1 Add New Entries

The user can append new barcode entries by clicking the button *Add*. All columns are filled with the actual settings from the *Barcode* page.

#### 8.2.4.2 Edit the Data List

The data in the list can be edited directly by **mouse click** (or by pressing **F2**). The user may change the content of the columns *Data, Composite Data, Text Above (1/2), Text Below (1/2), File Name* and *Comment.* The column *Data* is a mandatory field, for all other the input is optional.

#### 8.2.4.3 Delete Entries

By clicking the *Delete* button the user can delete one or more selected data list entries.

#### 8.2.4.4 Refresh

The *Refresh* button updates the error status of the data list entries.

#### 8.2.4.5 Populate Columns

If you want to populate a column with a text, choose a single cell, enter the desired value, leave the edit mode (by clicking enter), right clicking the cell and choose *Populate Column* from the **popup menu**.

### 8.2.5 Error Status

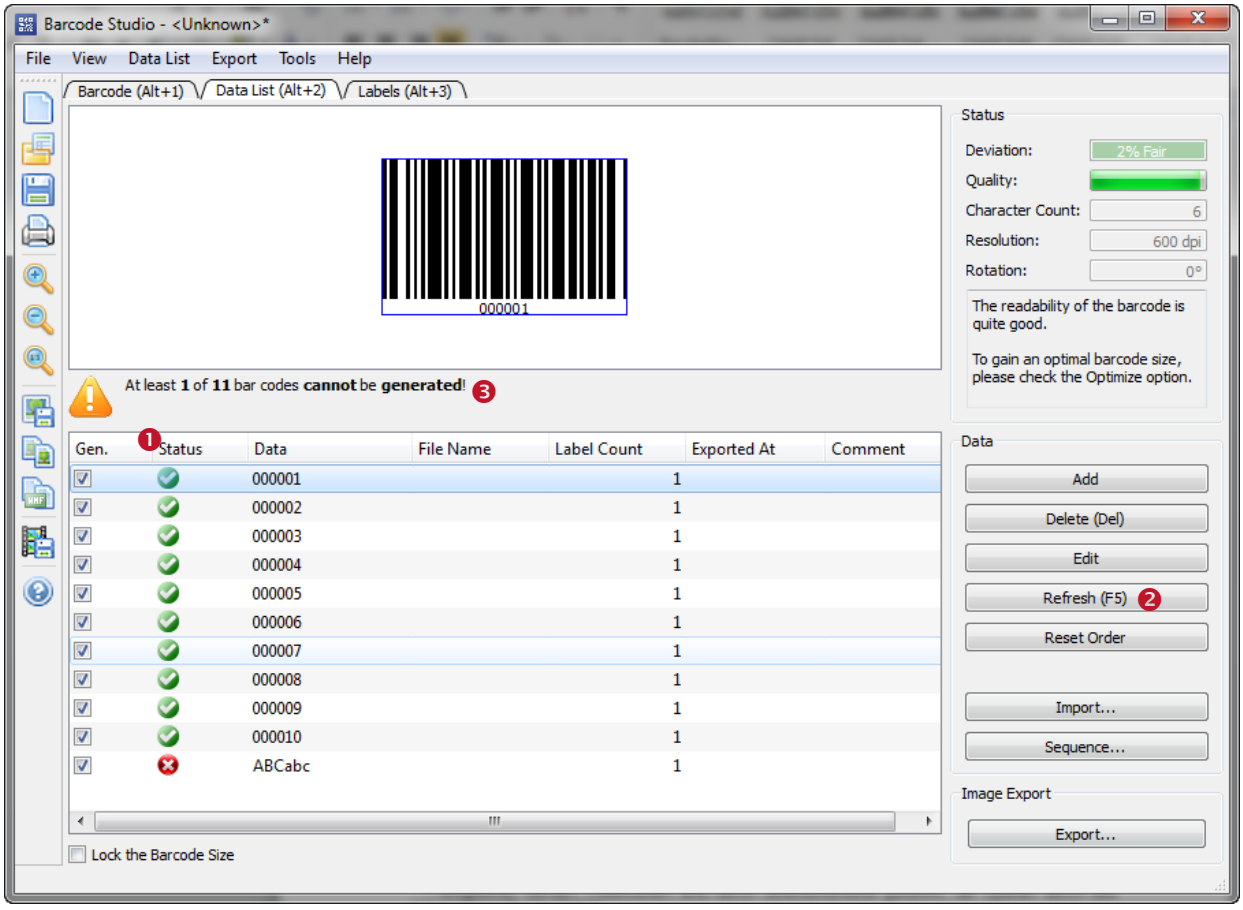



*Figure 37: Error Status*

The status icons in ❶ inform the user whether the data content of each row is valid for the actual barcode settings.

In order to avoid long update times, the error status is not kept up-to-date. The user has to click *Refresh* ❷ to see the ***real*** error status.

If one or more data rows produce an error, the user is informed about the number of invalid data rows through a ***warning box*** (see ❸).

## 8.3 File Import

### 8.3.1 Import Dialog

#### 8.3.1.1 File

Enter or choose the name of the import file in ❶. The file must be a text file with character-separated values (*.csv, *.tsv, etc.). The data rows are separated by line breaks and the columns by a specified separator character.

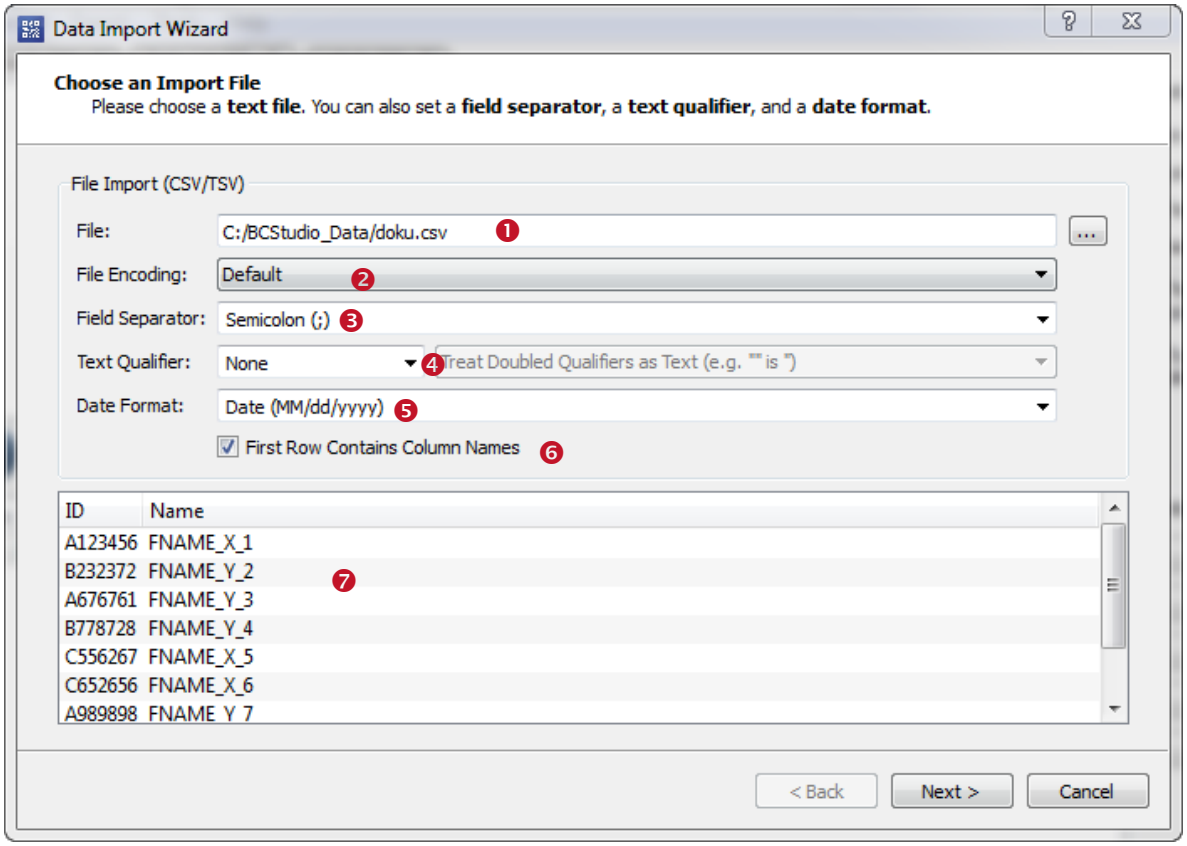



*Figure 38: File Import*

#### 8.3.1.2 File Encoding

The file import supports 3 kinds of file encodings (❷): *ANSI*, *UTF-8*, and *UTF-16*. Default for MS Windows is ANSI, default for Linux and Mac OS is UTF-8.

#### 8.3.1.3 Field Separator and Text Qualifier

The *field separator* (❸) divides data rows into several columns. Frequently used separator characters are **comma** (**,**), **semicolon** (**;**) and **tabulator**, but the user can specify any character he likes.

If the import data contains separator characters within a single column, the user has the option to specify a *text qualifier* character (❹). All characters between two related text qualifiers are handled as unit. Often used text qualifiers are **quotes** (‘) and **double quotes** (“). If the imported data contains text qualifiers, they have to be escaped by either doubling them (““→”) or by prepending a backslash (\” → “).

#### 8.3.1.4 Date Format

To import date fields correctly, the user may choose a *date format* ❺ which is used in the import file. Currently only one date format can be specified.

#### 8.3.1.5 First Row Contains Column Names

If the setting ❻ is checked the first row is assumed to contain the column names.

#### 8.3.1.6 Preview and Status

As soon a valid file name has been specified the preview ❼ shows the first lines of the import file.

### 8.3.2 Data Mapping

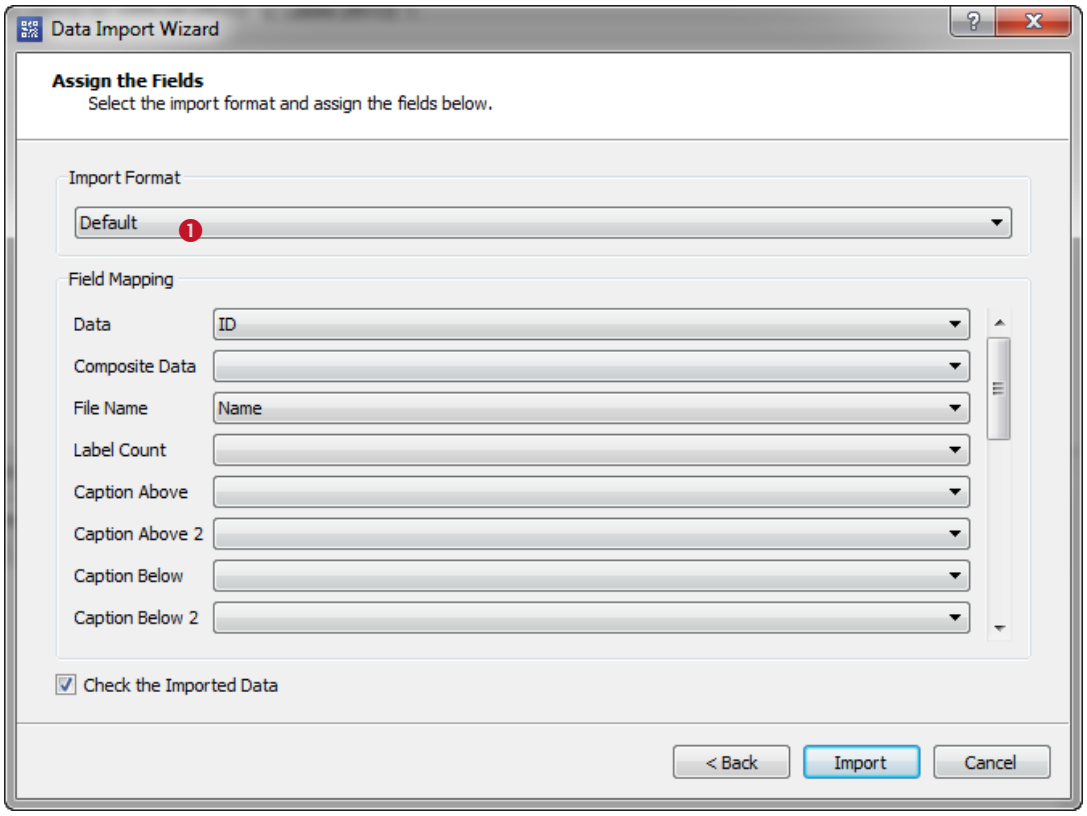



*Figure 39: Data Mapping*

Analogical to the data assistant when used for editing the data, the input assistant offers a comfortable way to import various data formats by choosing a suitable *import format* ❶.

In order to import raw data choose the *default* format.

Each column of the import file can be mapped to one of the columns *Data, Composite Data, File Name, Caption Above (1/2)* and *Caption Below (1/2)* in the data list. The selection of a *Data* column is mandatory, for all other columns the assignment is optional.

If you choose another import format, the fields according to the format are listed below (see below for examples).

It is recommended to check the field *Check the Imported Data* in order to keep data consistence as high as possible. It should be unchecked only if performance problems occur.

Below you find examples for importing various data formats.

Example vCard:

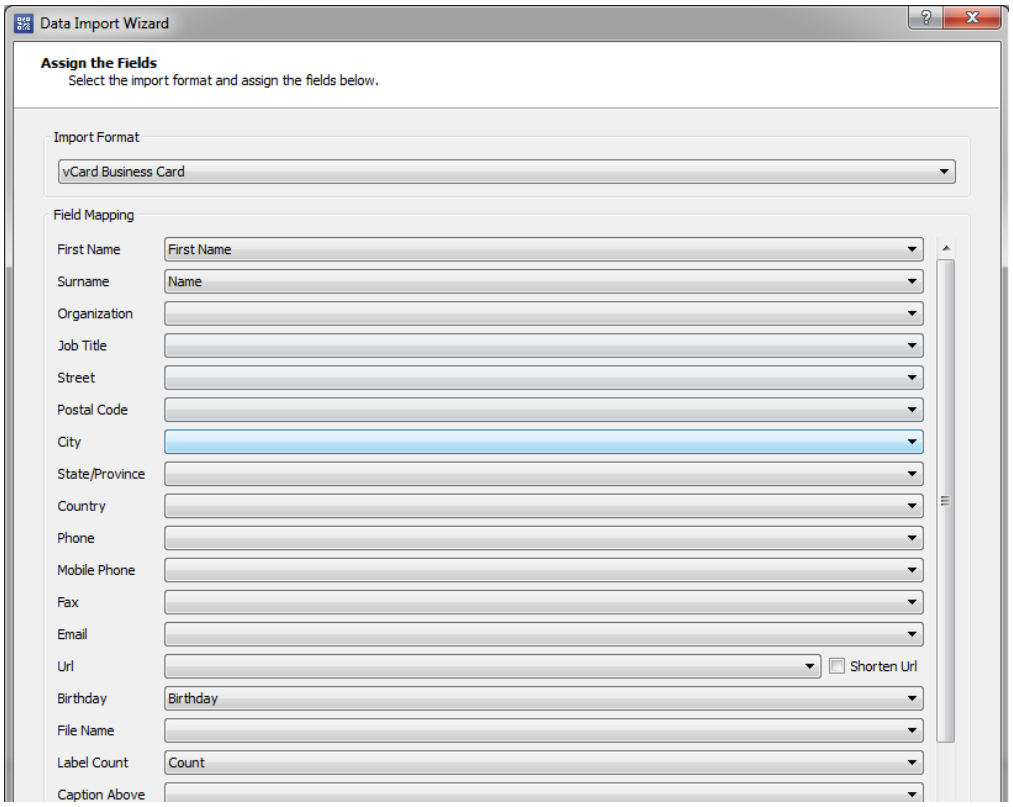



*Figure 40: Import Assistant – vCard*

Example Email:

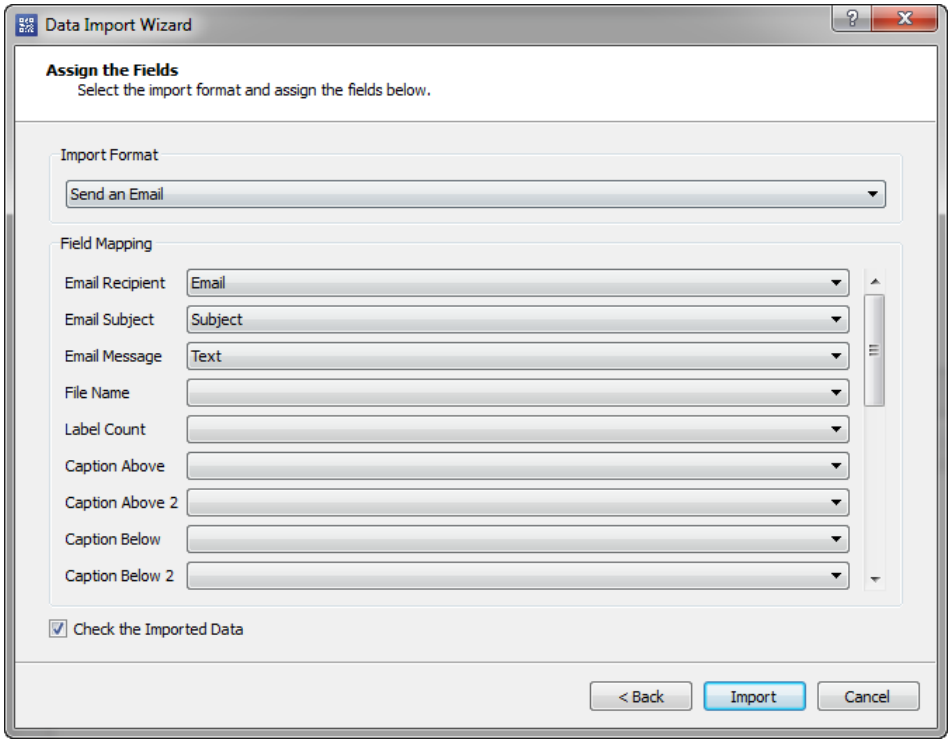



*Figure 41: Import Assistant – Email*

### 8.3.2.1 URL Shortening

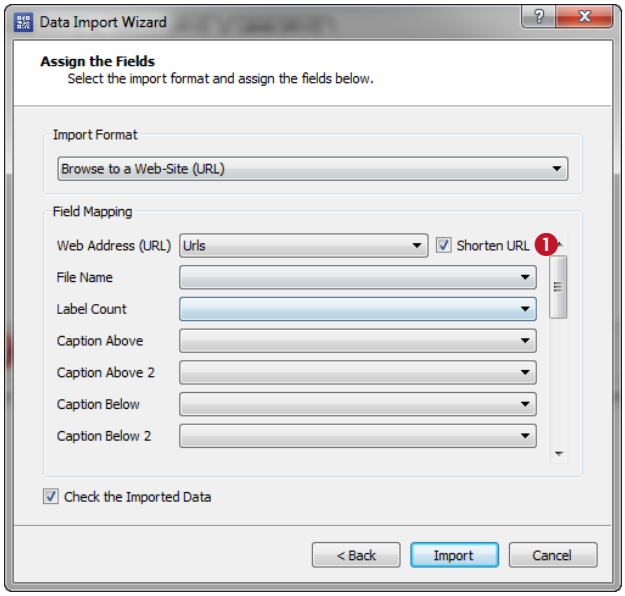



*Figure 42: URL Shortening*

Imported URLs can be shortened by clicking the *Shorten URL* checkbox (❶). To enable this feature you have to choose a URL Shortener service in the *Options* dialog (see chapter 10.3 URL Shortening).

► URL shortening means squeezing a long URL into a shorter one. This is important when creating mobile tagging QR-Codes for vCards, MeCards, SPARQCodes, etc. With URL shortening you reduce the amount of data to be encoded. Smaller, better readable, easier-to-share QR-Codes are the result.

► Shortened URLs provide an easy way to analyze the usage of the codes. Whenever a shortened URL is used to visit a web-page the shortening provider tracks this event. It does not matter if the user scanned the code with a smart phone, simply clicked on it in a twitter status message or entered the shortened URL manually into the address bar of the browser. At the time being both providers offer publicly visible tracking statistics for free.

## 8.4 Sequence Generator

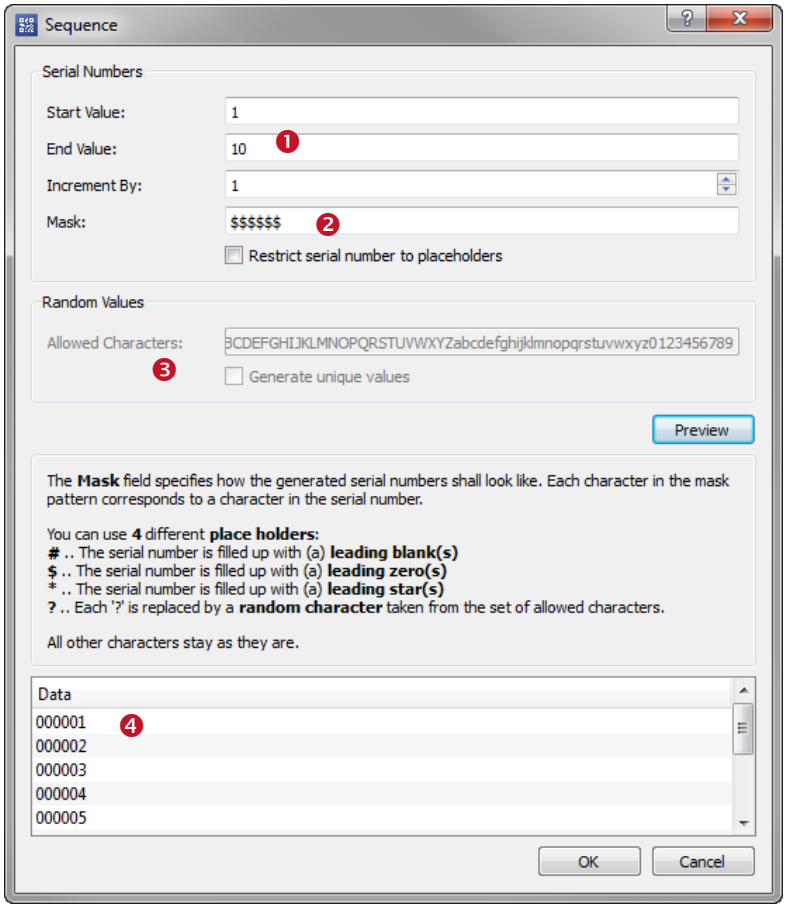



*Figure 43: Sequence Generator*

By clicking *Sequence…* the user opens the **Sequence** Dialog with the sequence generator. The sequence generator allows the user to fill the data column in the data list with formatted serial numbers.

### 8.4.1 Start Value / End Value / Increment

The range of a sequence is specified by the *Start Value*, the *End Value*, and the *Increment* (see ❶). The start value defines the lower bound of the range, the end value the upper bound, and the increment the step size between consecutive list items.

► The last value of the sequence will never exceed the number specified in *End Value*.

### 8.4.2 Mask

The *Mask* ❷ defines the pattern, which will be applied to the items of the sequence. The mask string may contain 4 kinds of placeholders, which are replaced by the digits of a serial or random number during generation. All other characters are left as they are.

| Character | Description |
|---|---|
| # | **Barcode Studio** inserts leading blanks instead of the placeholders, if the serial number has fewer digits than the Format string. |
| $ | Like "**#**" but insert leading zeroes instead of blanks. |
| * | Like "**#**" but insert leading stars instead of blanks. |
| ? | Each '?' is replaced by a random character (see 8.4.4 Random Value Generation). |
| | All other characters are used literally. |

*Table 19: Format – Characters*

Examples for serial numbers:

| Format String | Sample Output | Description |
|---|---|---|
| $$ | 01, 02, 03, …, 10, 11 | Leading zeroes |
| ## | 1, 2, 3, …, 10, 11 | Leading spaces |
| ** | *1, *2, *3, …, 10, 11 | Leading asterisks |
| 00$$ | 0001, 0002, 0003, …, 0099 | Like "$$" but with "00" as **constant** prefix |
| A$$ | A01, A02, A03, etc. | Like "$$" but with "A" as **constant** prefix |

*Table 20: Format – Examples*

► If you enter "$$$" and create a sequence containing numeric values higher than 999, the barcode data will be truncated. In this case change the format string.

### 8.4.3 Restrict Serial Numbers to Placeholders

This flag lets you decide whether the generated serial number is restricted to the number of placeholders. If ***yes*** the excessing digits in the front are cut off. If ***not*** all digits of the serial are shown.

You can use these flag to generate serial values without leading padding characters.

### 8.4.4 Random Value Generation

If the mask contains at least one '**?**', *random value* generation ❸ is enabled. Each '?' is replaced by a random value taken from the list of *Allowed Characters*.

If you choose *Generate unique values*, the resulting sequence is checked whether it contains multiple identical values. If so an error message is shown when clicking Ok. The user may try again or change the sequence parameters to be more successful.

### 8.4.5 Preview

Click *Preview* to create the sequence based on the settings specified above. The list ❹ shows a preview of the generated data.

Press *OK* to insert the sequence into the data list.

## 8.5 Export

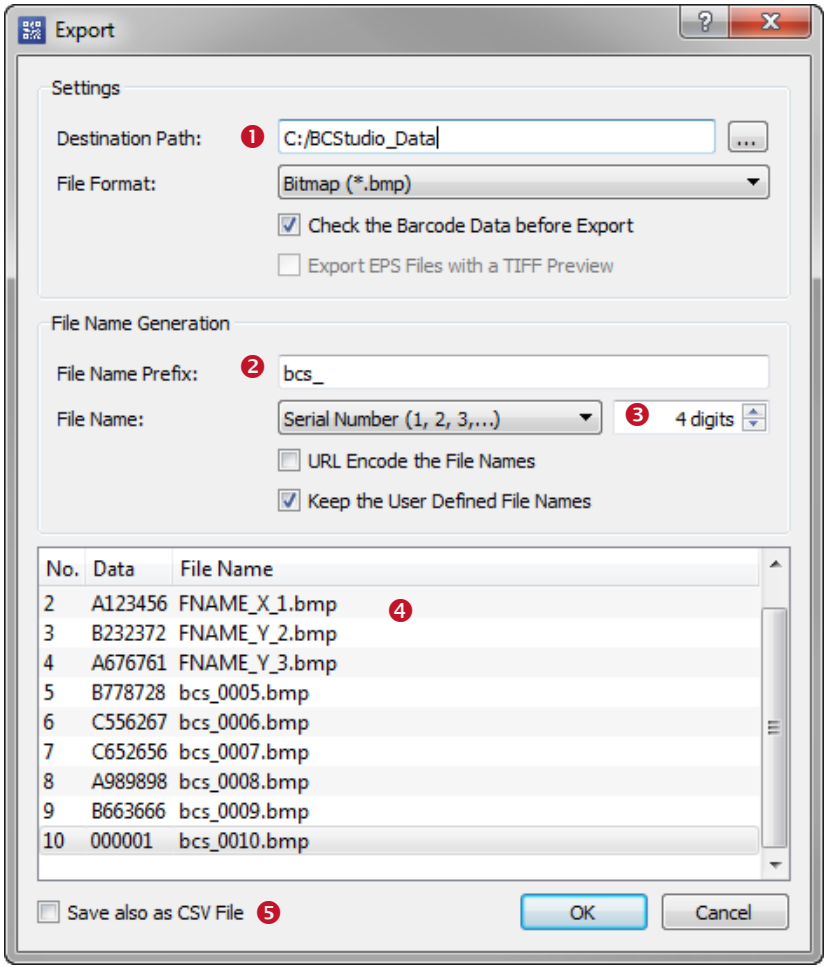



*Figure 44: Export Dialog*

By clicking *Export…* the **Export** dialog opens. Here the user can specify a destination directory (❶), a rule for the automatic generation of file names (❷), and other parameters.

### 8.5.1 Export Settings

#### 8.5.1.1 Destination Path

The destination path specifies to which directory the export images shall be saved.

#### 8.5.1.2 File Format

Specifies the file format of the export file. For a description of the different file formats, please refer to Appendix C.

#### 8.5.1.3 Check the Barcode Data before Export

If this field is checked, the barcode data is checked before the export. If the data list contains invalid data the user will be informed.

#### 8.5.1.4 Export EPS Files with a TIFF Preview

If this field is checked, a TIFF preview is added to the generated EPS files. The check box is only available if one of the *EPS* file formats is selected.

### 8.5.2 File Name Generation

#### 8.5.2.1 File Name Prefix

The file name prefix is prepended to the generated file name.

#### 8.5.2.2 File Name

The user has the possibility to choose between following file name generation methods:

| Generation Method | Description |
|---|---|
| Same as Data | The file name is based on the barcode data (sequence data). For instance if you encode "12345" in the barcode, the file name will be *prefix + 12345.bmp.* This method is ideal for numeric barcode data.<br>Note: if the sequence data contains characters that are not allowed for file names, please use URL-encoding. |
| Serial Number | The image file names are based on serial numbers starting with 1. The user can specify the number of digits for the generated numbers (❸). |

*Table 21: Sequence – File Name*

#### 8.5.2.3 URL-Encoding

If checked, the file names are URL-encoded. That means that characters that are not allowed in file names are escaped by a percent sign followed by the hexadecimal ASCII code.

| Character | HEX-Code | Character | HEX-Code | Character | HEX-Code |
|---|---|---|---|---|---|
| \ | %5C | / | %2F | : | %3A |
| * | %2A | ? | %3F | " | %22 |
| < | %3C | > | %3E | \| | %7C |
| % | %25 | | | | |

#### 8.5.2.4 Keep User Defined File Names

If checked, the file names, which are already defined in the data list, are kept. If unchecked all file names are overwritten by the file generation.

### 8.5.3 Preview

The preview ❹ demonstrates how the generated file names will look like.

### 8.5.4 Export

#### 8.5.4.1 Save as CSV File

The property ❺ specifies whether the data list shall be exported as CSV file. If enabled the dialog *Save as CSV File* opens after clicking *OK* (See *8.6 Save as CSV file*).

#### 8.5.4.2 Export Barcodes

By clicking *OK* the barcode images are exported.

If one or more of the image file cannot be generated, an error message will be shown. This may have one of the following reasons:

- An item of the sequence list cannot be encoded with the actual selected barcode type (e.g.: The symbology ***2of5 IL*** is used, but the barcode data does not contain only digits, but also characters.)
- An invalid file name has been generated (e.g.: A file name contains a backslash, but the option "URL Encode the File Names" was not selected).

Keep in mind that exporting many data list items can take *a lot* of time and hard drive space!

## 8.6 Save as CSV file

The dialog *Save as CSV File* can be opened either directly via menu. Or by checking *Save also as CSV File* in the *Export* dialog.

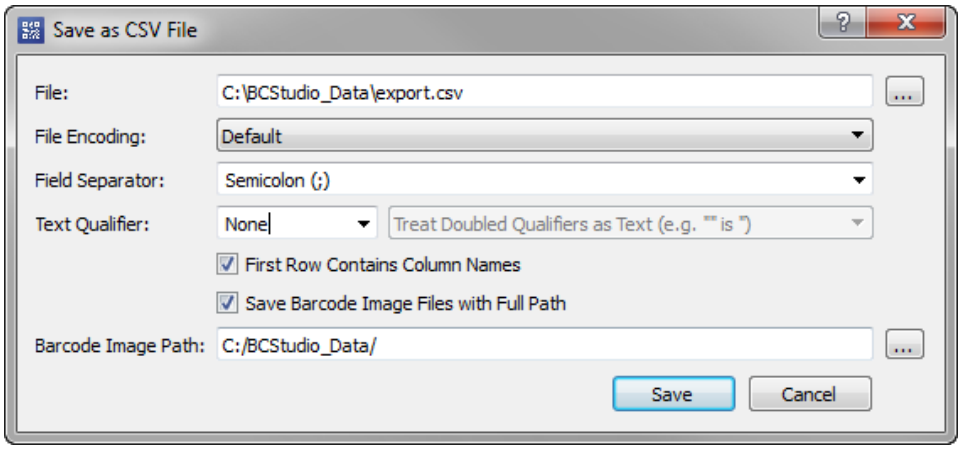



*Figure 45: Save as CSV File Dialog*

### 8.6.1 File

The destination file name of the export.

### 8.6.2 File Encoding

The export supports 3 kinds of *file encodings*: *ANSI*, *UTF-8*, and *UTF-16*. Default for MS Windows is ANSI, default for Linux and Mac OS is UTF-8.

### 8.6.3 Field Separator and Text Qualifier

The *field separator* divides data rows into several columns. Frequently used separator characters are **comma** (**,**), **semicolon** (**;**) and **tabulator**, but the user can specify any character he likes.

If the export data contains separator characters within a single column, the user has the option to specify a *text qualifier* character. All characters between two related text qualifiers are handled as single unit. Often used text qualifiers are **quotes** (**‘**) and **double quotes** (**“**). If the exported data contains text qualifiers, they are escaped by either doubling them (““→”) or by prepending a backslash (\” → “).

### 8.6.4 First Row Contains Column Names

If the setting is checked the first row contains the column names.

### 8.6.5 Save Barcode Image Files with Full Path

Determine whether to save the barcode image file names with the full export path.

### 8.6.6 Barcode Image Path

The destination path for the barcode images. This path is used to generate the full path names in the CSV file.

# 9 Label Printing

## 9.1 General

**Barcode Studio** offers a simple solution for printing barcodes on labels. Therefore the following steps are required:

- Configure the barcode settings
  (see chapter 7 Barcode Studio User Interface)
- Generate or import the barcode data
  (see chapter 8 Data List)
- Choose a suitable label template (❶) or define the labels yourself (❷)
  (see sections 9.2 Templates and 9.3 Settings)
- Preview the layout (❸) and print your labels (❹)
  (see sections 9.4 Preview and 9.5 Printing)

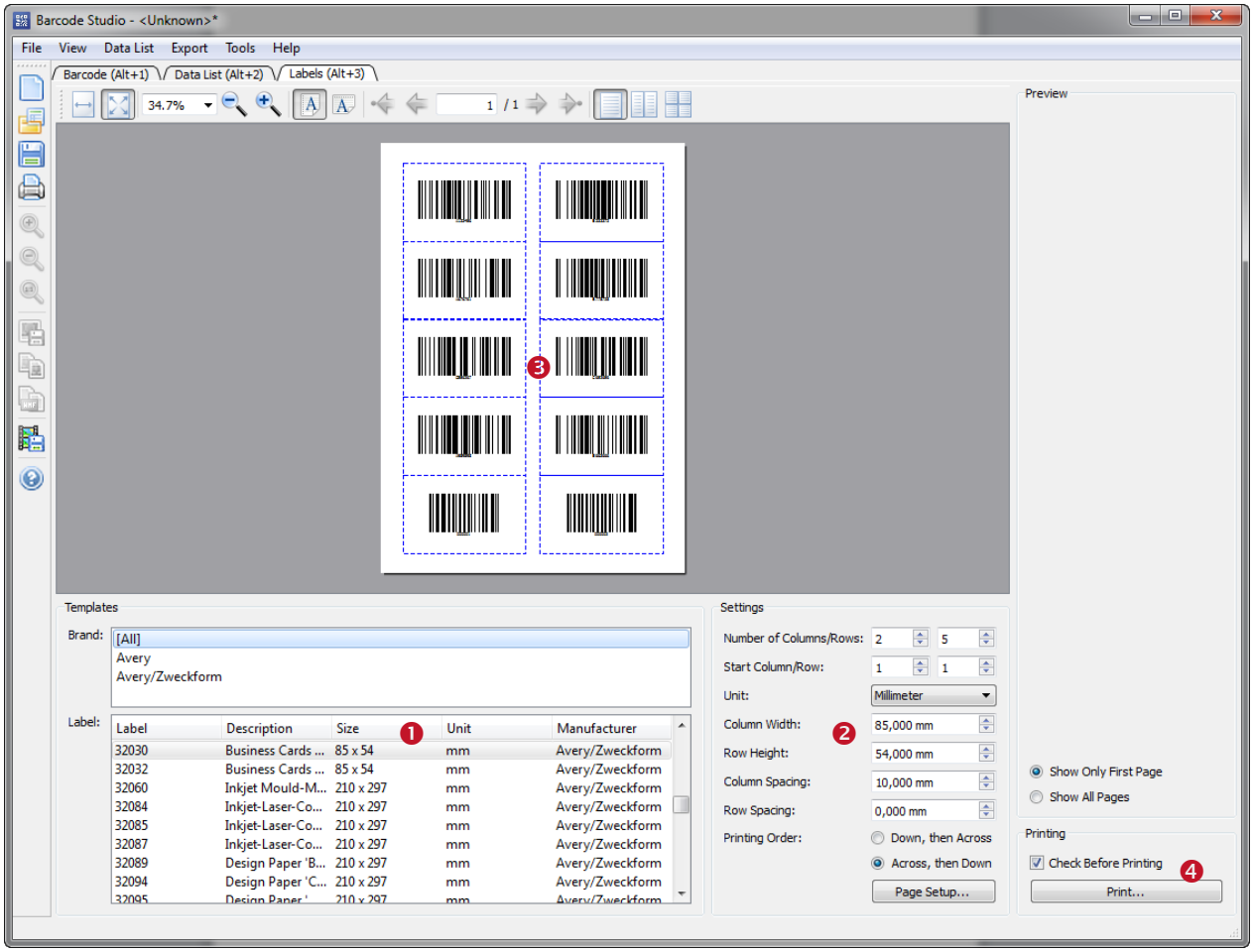



*Figure 46: Label Printing*

## 9.2 Templates

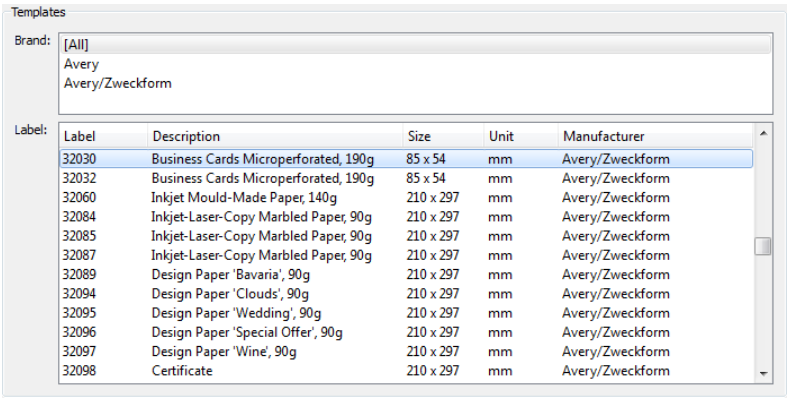

Templates
Brand:
[All]
Avery
Avery/Zweckform
Label:
Label Description Size Unit Manufacturer
32030 Business Cards Microperforated, 190g 85 x 54 mm Avery/Zweckform
32032 Business Cards Microperforated, 190g 85 x 54 mm Avery/Zweckform
32060 Inkjet Mould-Made Paper, 140g 210 x 297 mm Avery/Zweckform
32084 Inkjet-Laser-Copy Marbled Paper, 90g 210 x 297 mm Avery/Zweckform
32085 Inkjet-Laser-Copy Marbled Paper, 90g 210 x 297 mm Avery/Zweckform
32087 Inkjet-Laser-Copy Marbled Paper, 90g 210 x 297 mm Avery/Zweckform
32089 Design Paper 'Bavaria', 90g 210 x 297 mm Avery/Zweckform
32094 Design Paper 'Clouds', 90g 210 x 297 mm Avery/Zweckform
32095 Design Paper 'Wedding', 90g 210 x 297 mm Avery/Zweckform
32096 Design Paper 'Special Offer', 90g 210 x 297 mm Avery/Zweckform
32097 Design Paper 'Wine', 90g 210 x 297 mm Avery/Zweckform
32098 Certificate 210 x 297 mm Avery/Zweckform

*Figure 47: Label Templates*

### 9.2.1 Brand

By selecting a brand the list of label definitions can be filtered. The item [All] displays the complete label list.

### 9.2.2 Label

Choose the desired label from the list.

The settings for the selected label are shown in ❷ (see also section 9.3). These values can be adapted manually if required.

The preview window ❸ shows the label outlines (see also section 9.4).

## 9.3 Settings

Here you can change the label settings.

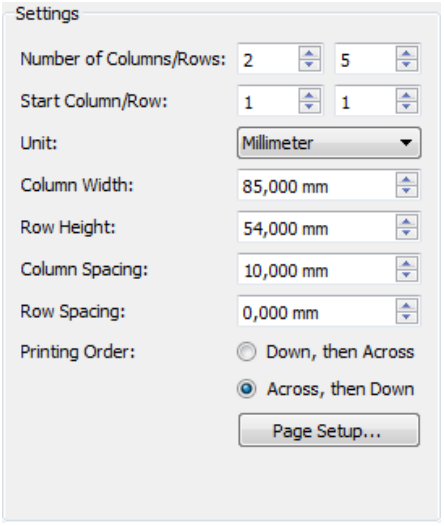



*Figure 48: Label Settings*

### 9.3.1 Number of Columns/Rows

Defines the number of label columns and label rows per page.

### 9.3.2 Start Column / Start Row

Defines the position of the first label to be printed on first page. Label positions before the given position are skipped. The effect of this setting depends on the printing order.

### 9.3.3 Unit

Specifies the unit of the label sizes.

### 9.3.4 Column Width

Defines the width of a label. All labels have the same width.

### 9.3.5 Row Height

Defines the height of a label. All labels have the same height.

### 9.3.6 Column Spacing

Specifies the horizontal gap between two labels.

### 9.3.7 Row Spacing

Specifies the vertical gap between two labels.

### 9.3.8 Print Order

Defines the order, in which the labels are printed (*Down, then Across* or *Across, then Down*).

### 9.3.9 Page Setup

After clicking *Page Setup…* a system dependent dialog opens. Here you can change the page settings, including the page margins.

## 9.4 Preview

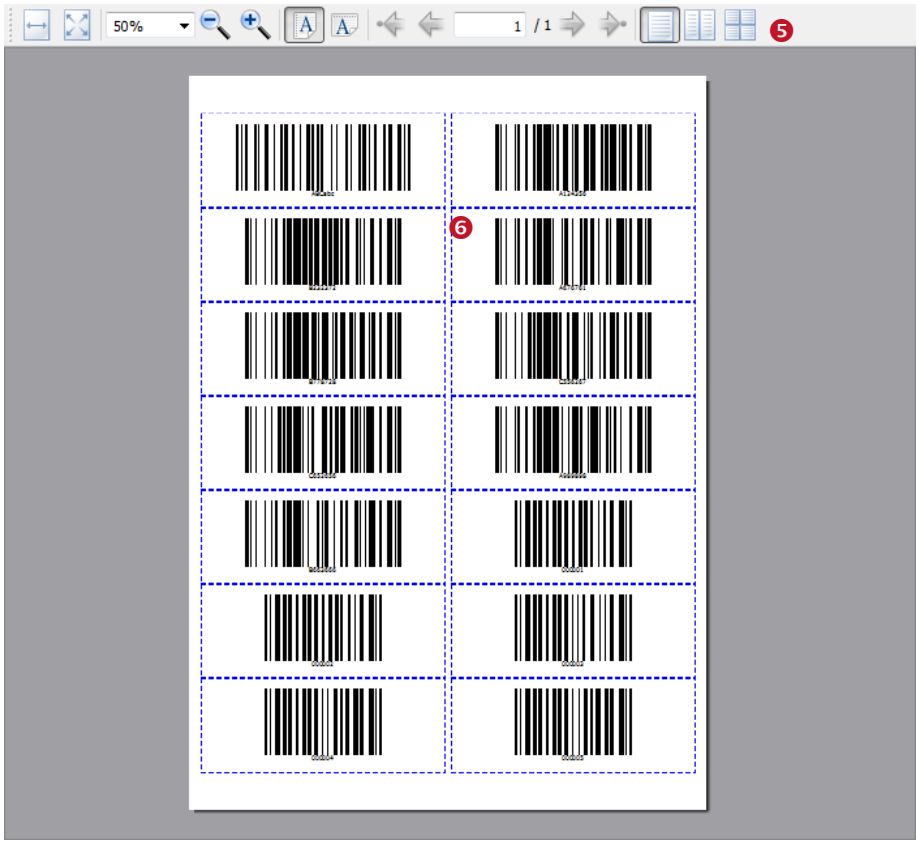



*Figure 49: Preview*

The label preview consists of a tool bar (❺) and a preview window (❻). The preview window shows the label outlines including the barcodes generated from the data list.

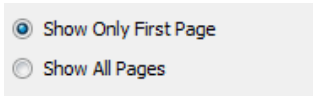



*Figure 50: Preview – Settings*

### 9.4.1 Preview

The preview gives you an idea how the print-out will look like. The barcodes are generated from the data in the data list. The dashed blue lines outline the label shapes. These are shown in the preview only, but not on the print-out.

*Figure 51: Barcode is being clipped*

If the barcode exceeds the size of the label, the label will be marked with a red frame. The user will be informed with an appropriate warning message.

### 9.4.2 Tool Bar

The tool bar gives the user the possibility to zoom in or out. Furthermore it allows the user to turn pages if the print job consists of multiple pages.

### 9.4.3 Settings

The user specifies whether only the first page or all pages are shown in the preview.

> ► The setting *Show All Pages* can decrease the performance of the preview rendering dramatically. Especially for a large number of data rows we recommend the setting *Show Only First Page*.

## 9.5 Printing

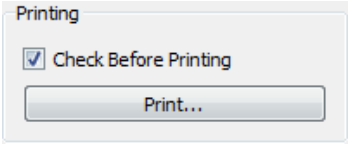



*Figure 52: Print Labels*

### 9.5.1 Check Before Printing

If this option is activated all barcodes will be checked before they are printed. If one or more barcodes cannot be created or if they are clipped, the user will be notified by an appropriate error message. The user may cancel or continue *at his risk*.

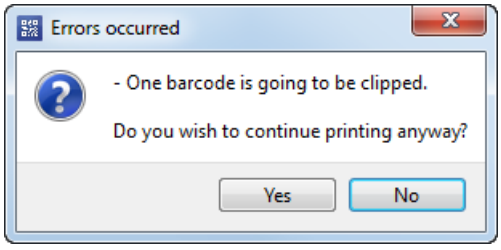



*Figure 53: Error Message*

> ► In order to avoid misprints we highly recommend you to activate this field.

### 9.5.2 Printing…

By clicking *Print…* the print dialog is opened. In this dialog you can select the printer, and you can specify the page range and the number of copies. The *Print* button confirms the dialog and starts the print job.

# 10 Options

In the Options dialog you can change general settings for the application. You can open the Options dialog via the menu *Tools* ► *Options…*

The settings in this dialog are saved into the file bcstudio.bcopt, which is located in the *Application Data/Program Data* directory (e.g., *C:\ProgramData\TEC-IT\BCStudio\15.2\examples*). They are loaded automatically each time **Barcode Studio** is started.

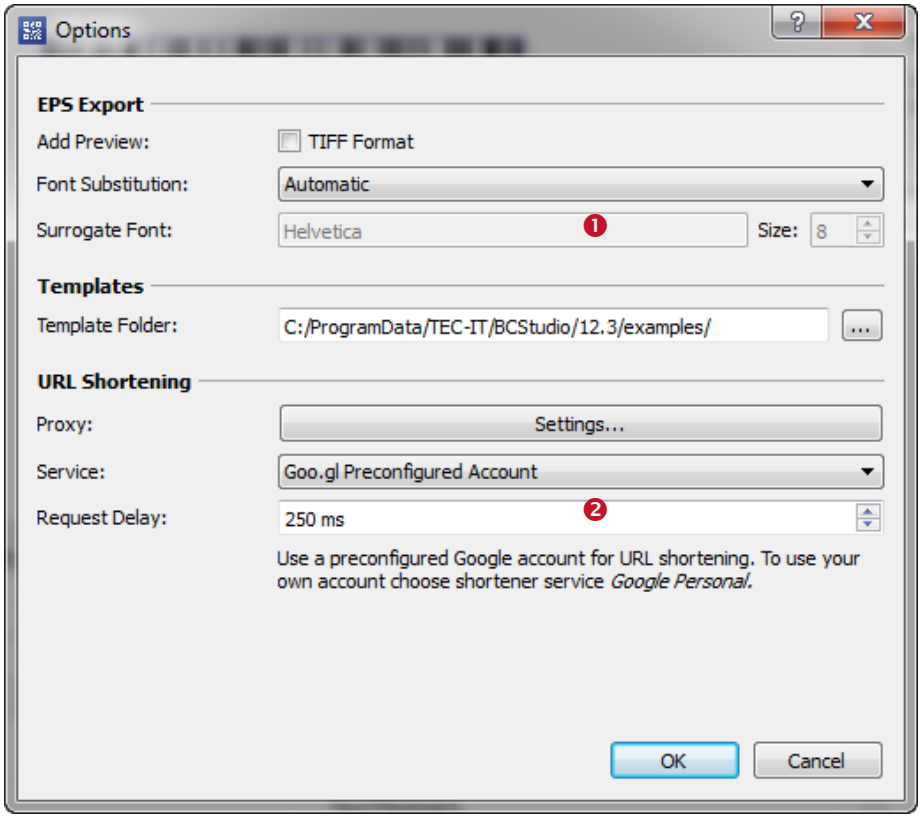



*Figure 54: Options Dialog*

## 10.1 EPS Export

### 10.1.1 Add Preview (TIFF)

Many applications are not able to process Postscript. In this case the embedded EPS documents are displayed as placeholders only (e.g., empty rectangles). To give the user a chance to see the content of the embedded document in the preview or in the design mode, the EPS generator offers the possibility to add a TIFF preview image to the EPS file.

The preview in TIFF format is supported by many applications (unfortunately not by all).

► If the preview mode is enabled, the size of the generated EPS files grows by a **multiple of the original file size**. So the preview mode should be disabled for printing a large number of documents.

### 10.1.2 Font Substitution

Font Substitution is only used when exporting the barcode to an EPS file. This is an advanced option and should only be changed for special applications.

| Font Substitution | Description |
|---|---|
| None | The font will not be substituted, unless it is invalid. |
| Automatic (Default) | The font will always be substituted with an appropriate one. |
| Fixed Font | The font will always be substituted with the font specified in “Surrogate Font” |

*Table 22: Font Substitution*

### 10.1.3 Surrogate Font

Specifies the font for EPS exports. This property overrides the “Font” property on the “General” tab, but only if “Font Substitution” (❶) is set to “Fixed Font”.

Please note that you have to specify the “internal font name” (may not contain any spaces).

## 10.2 Templates

### 10.2.1 Template Directory

All template files (***.bc**), which are listed in the template tree in the main window, are read from this directory. The template directory path is preset by the setup routine, but it may be changed afterwards if required (e.g., if the user wants to use a custom set of templates).

## 10.3 URL Shortening

Web addresses (=URLs) can be shortened by using URL Shortener services. Barcode Studio offers this feature when editing URLs in the data assistant and during the import. Shortener services convert the original, possibly long URLs into their short counterpart. If you call a shortened URL, the original web site will be opened.

### 10.3.1 Proxy

In order to be able to access network or internet, you often have to change the proxy settings.

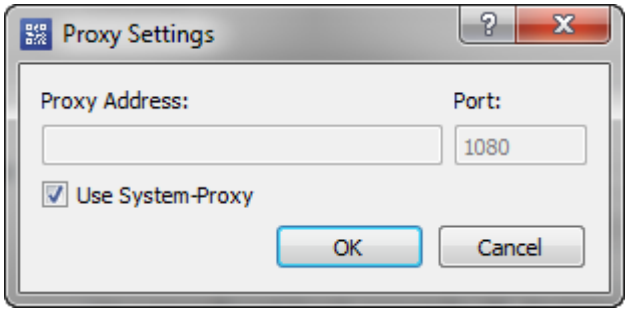



*Figure 55: Proxy Dialog*

#### 10.3.1.1 Use System-Proxy

Use the system settings for the proxy. In most cases this will be the correct decision.

#### 10.3.1.2 Proxy Address / Port

If you cannot use the system-proxy, you are able to set the address and the port of the proxy directly.

### 10.3.2 Service

Choose the service, by which the URLs should be shortened.

- If the preconfigured account returns an error message, we recommend you to use your own account (for instance at Google) and activate the “URL Shortener Service” for it.
- Then choose the suitable personal account in the options dialog and enter the account data (application key etc.).

### 10.3.3 Service Specific Settings

Each service uses specific settings (❷), for instance API Key, user name, request delay, etc.

# 11 FAQ

- For more information on the barcodes and their parameters, please check out the **TEC-IT Barcode Reference** on http://www.tec-it.com/download/PDF/Barcode_Reference_EN.pdf
- More Information can be found on our website http://www.tec-it.com/support/faq/Default.aspx
- In case of problems, please contact our support team: support@tec-it.com.

## 11.1 How can I encode the FNC1 character in EAN128?

Enable the option “Escape Sequences” (page Settings) and insert the following escape code into the data:

| Control character | Escape sequence | Barcode type(s) |
|---|---|---|
| FNC1 | \F | Code 128, EAN128, UCC128, GS1-128, GS1-DataBar EAN.UCC Composite Symbology |

Read more about Application Identifiers (EAN/UCC/GS1) in our Barcode Reference.

## 11.2 How can I encode the FNC1 character in GS1/UCC/EAN Data Matrix?

Set the “Code Format” (page Data Matrix) to **GS1/UCC/EAN**, enable the option “Escape Sequences” (page Settings) and insert the following escape code into the data:

| Control character | Escape sequence | Barcode type(s) |
|---|---|---|
| FNC1 | \F | EAN Data Matrix |

Read more about Application Identifiers (EAN/UCC/GS1) in our Barcode Reference.

## 11.3 Escape-Sequences are not encoded (and the scanner signals an error)

Escape sequences are used for encoding special characters. An escape sequences consists of a backslash “\” followed by a character or a hex value. For example, the escape sequence “\t” is used for printing a tabulator character.

Escape sequences are only translated if the checkbox “Escape Sequences” (page Settings) is enabled (see section 7.8.1.3)!

## 11.4 After saving the barcode to an image file, my barcode scanner cannot read the barcode!

The bars and spaces in the symbol must have precise widths. By creating a bitmap image from the barcode, the widths are adapted to the matrix of the bitmap. Depending on its resolution more or less deviations can occur. The lower the resolution, the more differences in the width of the bars/spaces will usually appear.

There are different strategies to overcome these problems – please check out the section “Resolution and Readability” in the Barcode Reference for more information.

# 12 Licensing

## 12.1 License Types

Please check out http://www.tec-it.com/order/Default.aspx for available license types and pricing.

## 12.2 Entering your License Data

To enter the license data select *Help ► License…* from the menu. The dialog below will appear. Barcode Studio provides two methods for entering the license data:

- Online Activation using the Activation Key (see 12.2.1).
  This is the default method. Internet access is required.
- Manual Licensing (see 12.2.2).
  Please get in touch with us if your system has no internet access or if you prefer to use the manual activation for any other reason. We will be glad to send you the license data which is suitable for manual licensing.

### 12.2.1 Online Activation using an Activation Key

If you have received an *activation key* from TEC-IT, please use the *online* product activation ❶. Internet access is required.

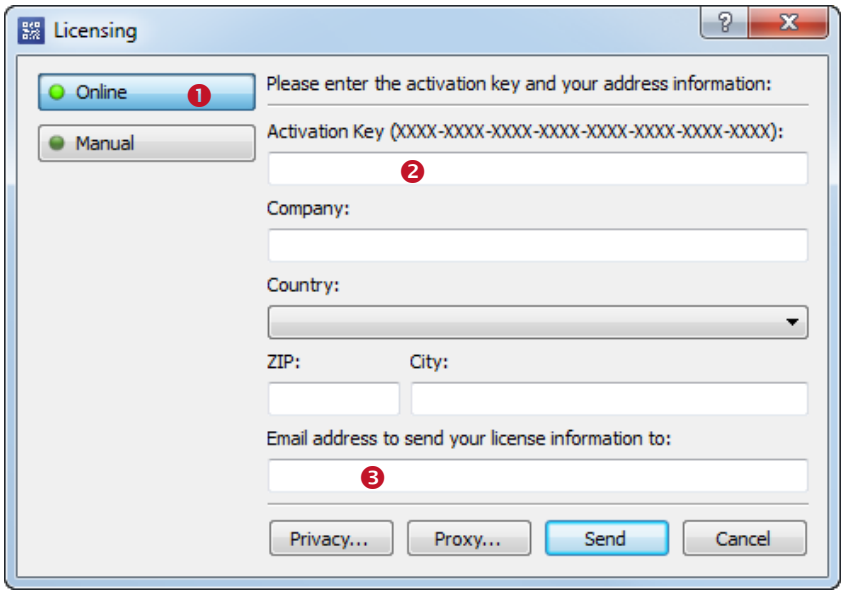



*Figure 56: License Dialog – Online Activation*

1. In field ❷ enter the activation key.
2. In field ❸ enter your email address. A license certificate will be sent to this address automatically.
3. Complete all remaining data (Company, Country, ZIP Code, and City). For a successful activation all fields are required.
4. Confirm the entered data by clicking *Send*.

A message will inform you about the successful activation. In case of problems or errors, please contact TEC-IT.

### 12.2.2 Manual Licensing

Manual licensing is the alternative method for licensing if your system has no internet connection. Select manual licensing ❹ and enter the license data as provided by TEC-IT.

- ► Please enter the license data exactly as you received it from TEC-IT!
  Spacing and upper/lower case letters are to be considered. To avoid typographical errors, please insert the data using “copy and paste” from the email containing your license data whenever possible.
- ► Single licenses
  If you purchased a single (workstation) license, you need to provide the so-called *"System ID"* (or *hostname* on LINUX and MAC) of the target computer. You can find the *System ID* (or *hostname*) in the licensing dialog (see below).

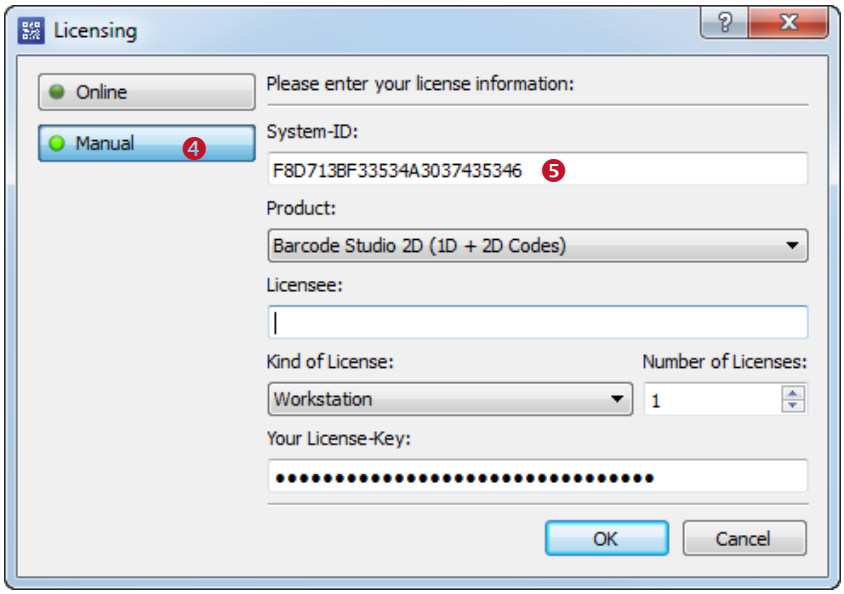



*Figure 57: License Dialog – Manual Licensing*

The following steps are required to license the product:

1. On the top of the dialog you find the *System ID*[1] (❺) of your computer.
   For single licenses we will ask you to send us the System ID of the target computer.
2. In the field *"Product"* please choose between “Barcode Studio 1D (Linear Codes)” and “Barcode Studio 2D (1D + 2D Codes)”.
3. In the field *"Licensee"* enter the name of the license holder.
4. In the field *"Kind of License"* select the kind of license that you have purchased. Possible license types are:
   - Single
   - Site
   - Enterprise
5. In the field *"Number of Licenses"* enter the number of licenses that you have purchased.
6. In the field *"Your License-Key", e*nter the license key exactly as received from TEC-IT.
7. Confirm the dialog with *OK*.

A message will inform you about the successful activation. In case of problems or errors, please contact TEC-IT.

[1] On UNIX, Linux or Mac OS X the hostname of the system is used as System ID (relevant only for Single licenses)

## 12.3 Temporary Test Licenses

For a restricted period of currently 10 days, you have the possibility to gain a temporary, but otherwise unrestricted test license for one time.

When opening **Barcode Studio** you see a dialog, which allows you to request a test license online.

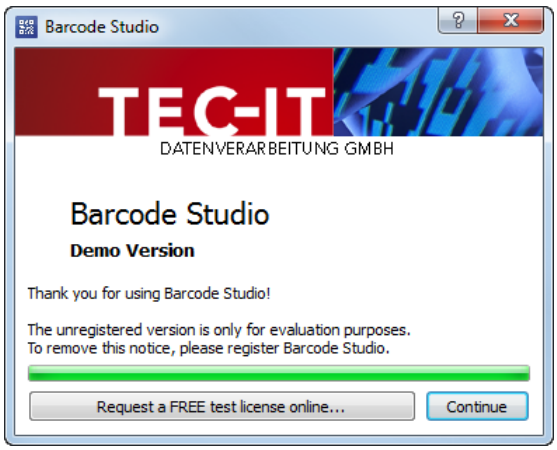



*Figure 58: Request Test License*

Please click the button *Request a FREE test license online…*. The license data is transmitted automatically. In the case of an error please contact TEC-IT.

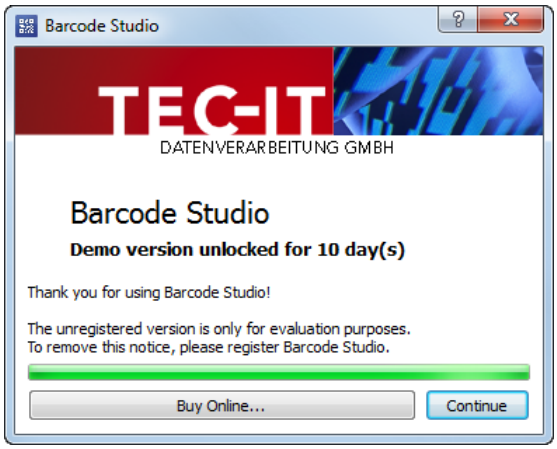



*Figure 59: Demo Version Unlocked*

If you have received the test license successfully, you are informed about the remaining test period with every application start.

# 13 Contact and Support Information

**TEC-IT Datenverarbeitung GmbH**

Address: Hans-Wagner-Str. 6
AT-4400 Steyr
Austria/Europe
Phone: +43 / (0)7252 / 72 72 0
Fax: +43 / (0)7252 / 72 72 0 – 77
Email: office@tec-it.com
Web: http://www.tec-it.com

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# Appendix A: Barcodes

## A.1 Supported Barcodes

Please refer to the additional document “Barcode Reference” available from www.tec-it.com.

This document contains an overview of the supported barcodes, enumeration values (for developers using **TBarCode OCX),** the standard print ratio and the standard check digit methods.

### A.1.1 MaxiCode

#### 13.1.1.1 Setting SCM parameters

Please refer to the additional “Barcode Reference” available from www.tec-it.com.

## A.2 Check Digits

The method for the check digit(s) calculation depends on the respective barcode type. A standard method for each barcode type is supplied.

See section 7.8.1.1 for adjusting the check digit in **Barcode Studio.**

For more information please refer to the “Barcode Reference” available at www.tec-it.com.

## A.3 Print Ratio

The Print Ratio is the relationship between the widths of the bars and the widths of the gaps of a barcode. Each barcode symbology should be generated with certain print ratios only.

See section 7.8.2.1 for adjusting the print ratio in **Barcode Studio.**

For more information please refer to the “Barcode Reference” available at www.tec-it.com.

## A.4 Format

Format is like a "mask”, which is used for formatting the barcode data before encoding (please do not mix up the Format with the Ratio Format). Placeholders in the specified format string can be mixed with constant data characters to build a final barcode data string. Also control characters are supported.

See section 7.8.3.1 for adjusting the format string in **Barcode Studio.**

For more information please refer to the “Barcode Reference” available at www.tec-it.com.

## A.5 Escape Sequences

If you want to encode non-printable or special characters in a barcode, “Escape Sequences” must be used. They always start with a backslash (“\”) followed by the sequence. They can be used for encoding binary data (Bytes) too (if the symbology you are using offers this feature – e.g. PDF417 or Data Matrix).

See section 7.8.1.2 for enabling or disabling the translation of escape sequences in **Barcode Studio.**

For more information please refer to the “Barcode Reference” available at www.tec-it.com.

# Appendix B: Error Messages

| Error | Recommended Action |
|---|---|
| Wrong character 'x' at position y! | You entered a character which cannot be encoded with the selected barcode symbology. Please use different barcode symbology or change your input data. |
| Wrong character 'x' at position y in the Format string! | You entered a character to the format string which is no valid Format command and cannot be encoded with the selected barcode symbology. Please change or remove the invalid character from the Format string or use another symbology. |
| Wrong check digit 'x' at position y! | You entered a check digit which is incorrect for the selected barcode symbology. Please correct the check digit or remove it, so the application will calculate it automatically. |
| Wrong number of input characters (needs x chars)! | You entered too many or too few characters for the selected barcode symbology. Please use another symbology or correct the length of the input data. |
| Input string too long | The input string is too long for **Barcode Studio.** Please reduce the length of the input data. |
| Barcode does not fit into bounding rectangle | The output resolution is too small to produce a readable barcode with given symbol size. You either have to increase the width/height of the barcode, the module width, or the output resolution. |
| No input characters | No barcode data is specified. Please enter some data in the *Barcode Data* field. |
| Invalid code page or invalid characters! | You entered characters which cannot be encoded in the selected code page. Please use a different code page or change the input data. |
| Not implemented (reserved for future use) | The selected barcode symbology is not supported yet. Please contact TEC-IT for an implementation request. |
| Invalid data format. Please examine the specification | The input data are not suitable to the definition of given barcode type. Please examine the specification of the barcode type about the required data format.<br>This error message is shown mainly if a detailed error description would exceed the available space. |
| Quiet zone too small for vertical bearer bars | You chose bearer bars of type *Rectangle*. This setting needs a horizontal quiet zone of sufficient size. Please increment the left and the right quiet zone to at least 12 modules. |
| Error in linear Component: … | You want to generate a composite symbology. The data for the linear symbol is incorrect. The following error message describes the problem more detailed. |
| Error in 2D Composite Component: … | You want to generate a composite symbology. The data for the 2D component is incorrect. The following error message describes the problem more detailed. |
| Invalid number of input characters in combination with composite! | When using UCC/EAN-128 as part of a composite symbology you have to enter a minimum amount of *symbol* characters (which is not equal to the amount of *input* characters). Please increase the number of input characters in the *Barcode Data* field. |

*Table 23: Error Descriptions*

# Appendix C: Image Types

Choosing *Export* ► *Export Barcode…* the barcode can be converted to a bitmap or image format. The following image types are available. Please keep in mind that the barcode might get unreadable if the resolution of the generated bitmap is too low (does not apply for vector based image formats).

| Image Format | Description | Internal Format | Color | Printing Resolution included? |
|---|---|---|---|---|
| BMP | Microsoft Windows Bitmap. | Bitmap | color (RGB) | Yes |
| AI | Adobe Illustrator v7<br>Offers the following sub-formats:<br>▪ CMYK<br>uses CMYK color space (4 color channels).<br>▪ RGB<br>uses RGB color space (3 color channels).<br>▪ Grayscale<br>uses one channel (luminance) only. | Vector | color (CMYK, RGB) or grayscale | |
| EPS | Encapsulated PostScript.<br>Offers the following sub-formats:<br>▪ CMYK<br>▪ RGB<br>▪ Grayscale<br>See AI format.<br>Please note that the EPS export may require additional font adjustments (see section 10.1.2). | Vector | color (CMYK, RGB) or grayscale | No |
| GIF | Graphics Interchange Format. Supported since **Barcode Studio** V7. Not supported in previous versions because of license terms. | Bitmap | color (RGB) | No |
| JPG | Joint Photographic Expert Group image file format. | Bitmap | color (RGB) | Yes |
| PDF | Portable Data Format. | Vector | color (RGB) | No |
| PNG | Portable Network Graphics. | Bitmap | color (RGB) | Yes |
| SVG | Scalable Vector Graphics | Vector | color (RGB) | No |
| TIF | Tagged Image File. No compression is used (compressed formats available on request). | Bitmap | color (RGB) | Yes |

*Table 24: Image Formats*

# Appendix D: Command Line Parameters

**Barcode Studio** can also be started from the command line. It supports various parameters which allow the user to automate the barcode-generation process.

## D.1 Syntax

```
1) BCStudio -d=<data> -out=<outputfile> [[-s=]<settingsfile>] [-h=<height>] [-w=<width> |
            -m=<modulewidth>] [it=<imagetype>] [-r=<dpi>] [-o] [-rot=<rotation>]
            [-fs=<fileseparator>] [-log=<logfile>] [-q]
2) BCStudio -datafile=<datafile> -out=<outputfile> [[-s=]<settingsfile>] [-h=<height>]
            [-w=<width> |-m=<modulewidth>] [it=<imagetype>] [-r=<dpi>] [-o]
            [-rot=<rotation>] [-fs=<fileseparator>] [-log=<logfile>] [-q]
3) BCStudio -datalist=<datalistfile> [-skipheader=<numlines>] -outlist=<outputlistfile>
            [[-s=]<settingsfile>] [-h=<height>] [-w=<width> |-m=<modulewidth>]
            [it=<imagetype>] [-r=<dpi>] [-o] [-rot=<rotation>] [-fs=<fileseparator>]
            [-log=<logfile>] [-q]
4) BCStudio <settingsfile>
5) BCStudio -g [[-s=]<settingsfile>]
6) BCStudio [-? | -help]
```

| | |
|---|---|
| **-d=<data>** | Specifies the barcode data. Can be used alternatively to *-datafile=<datafile>* and *-datalist=<datalistfile>.* |
| **-datafile=<datafile>** | Specifies the barcode data through a data file. Can be used alternatively to *-d=<data>* and *-datalist=<datalistfile>.* |
| **-datalist=<datalistfile>** | Specifies the file that contains a list of data strings (separated line breaks). Can be used alternatively to *-d=<data>* and *-datafile=<datafile>*.If this argument is used you must also specify *-outlist=<outputlistfile>*. The number of entries in both lists should be equal. |
| **-skipheader=<numlines>** | Specifies the number of lines of the data list that should be handled as header lines and so skipped. This argument can only be used in conjunction with *-datalist=<datalistfile>.* |
| **-out=<outputfile>** | The name of the output file (image file). The filename extension may be one of the following: JPG, GIF, TIF, BMP, PNG, EPS, and PDF. The filename extension must be specified! Can be used alternatively to *–outlist=<outputlistfile>*. |
| **-outlist=<outputlistfile>** | The name of the file that contains a list of output file names (separated line breaks). Can be used alternatively to *–out=<outputfile>*. If this argument is used you must also specify *-datalist=<datalistfile>*. The number of entries in both lists should be equal. |
| **[-s=]<settingsfile>** | Settings-Files are *.bc files which have been created with **Barcode Studio**. By passing command line arguments you can override values of the settings file.<br>If you pass only the settings file without an argument name and no other argument, the application is opened in graphics mode. |
| **-h=<height>** | Height of symbol, measured in 1/1000mm. |
| **-w=<width>**<br>**-m=<modulewidth>** | Specify either the total width of the symbol or the module width (dimension X or narrow bar width); values are measured in 1/1000mm.<br>E.g.: -w=50250 … barcode is 50.25 mm wide |
| **-it=<imagetype>** | The type of the output file. It may have the same values as the file name extensions. |
| **-r=<dpi>** | The resolution of the output file in dpi (default = 600 dpi). |
| **-o** | Optimal resolution (adapt module width to pixel width) – recommended for low resolution devices. |
| **-rot=<rotation>** | The barcode rotation in degrees. Valid values are 0, 90, 180, and 270 (default = 0). |
| **-fs=<fileseparator>** | A custom file separator that can be used for separating file names of command line arguments and for the list of file names in the output file names list. |
| **-log=<logfile>** | The name of the log file. If this argument is not set, no log file is generated. |
| **-q** | Activates the “Quiet Mode”. The program does not interact with the user. This setting is useful, for instance, to run **Barcode Studio** on servers.<br>If an error occurs, a message is logged to file *error.log*. |
| **-g** | Starts the application in "Graphics Mode". This setting is needed to pass a settings file to **Barcode Studio** and start it in graphics mode. |

| | |
|---|---|
| **-?**<br>**-help** | Display the help screen. |

## D.2 Examples

Generate Code128 (default), content=98765, size 50x30mm:

```
bcstudio -d="98765" -out=barcode.bmp -w=50000 -h=30000 -o
```

Generate a barcode image (JPG) with 300 dpi and 0.330 mm module width:

```
bcstudio -d="12345" -out=barcode.jpg -h=30000 -m=330 -r=300
```

Generate a barcode (symbology defined in bc file) 70x30mm:

```
bcstudio -d="123" -out="c:\pictures\bc.jpg" -s=bcsettings.bc -w=70000 -h=30000 -o
```

Generate a barcode with data from txt file:

```
bcstudio -datafile=data.txt -out=barcode.tif -s=bcsettings.bc -w=70000 -h=30000 -o
```

Generate a list of barcodes using the arguments datalist and outlist:

```
bcstudio -datalist=datalist.txt -outlist=outputfilenames.txt -s=bcsettings.bc -o
```

Generate a barcode with optimized readability and fixed module width:

```
bcstudio -d="ABCDE" -out=barcode.bmp -s=bcsettings.bc -h=30000 -m=265 -o
```

Open a settings file in graphics mode:

```
bcstudio bcsettings.bc
  or
bcstudio -g -s=bcsettings.bc
```